TECHNOLOGY DEPT.

Gas Journal

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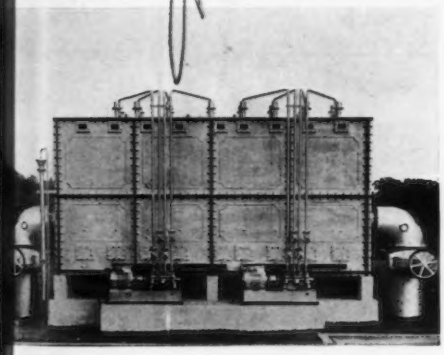
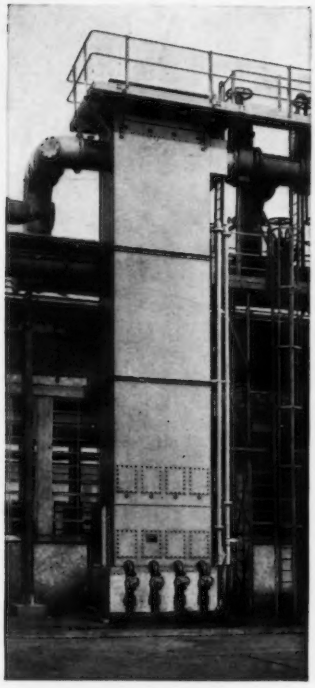
DETROIT

VOL. 286. 108th YEAR. LONDON, MAY 30, 1956. No. 4846. PRICE 1/6

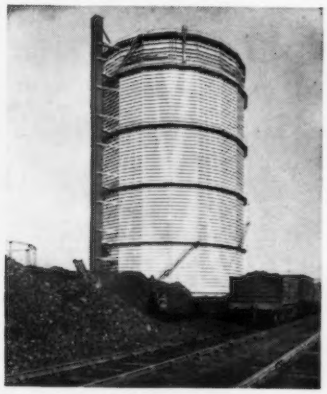
RAL GASHOLDERS

ASHING PLANT



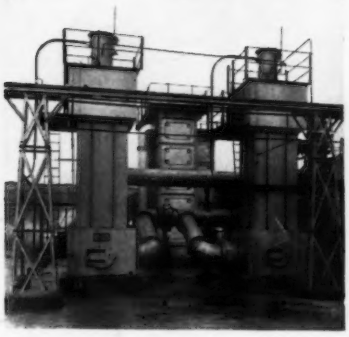


CONDENSERS



WATERLESS GASHOLDERS

ELECTRO-DETARRERS



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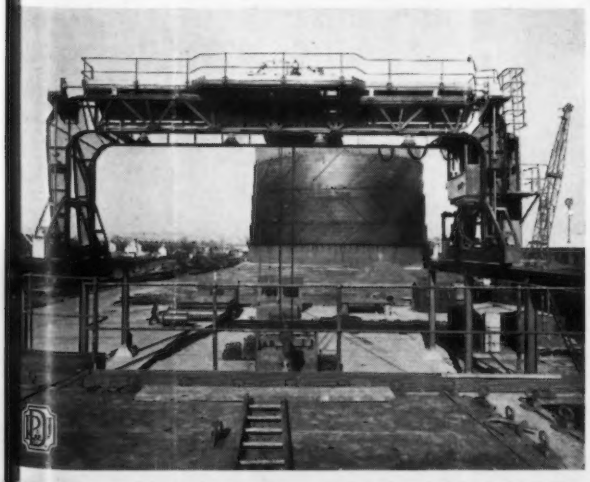

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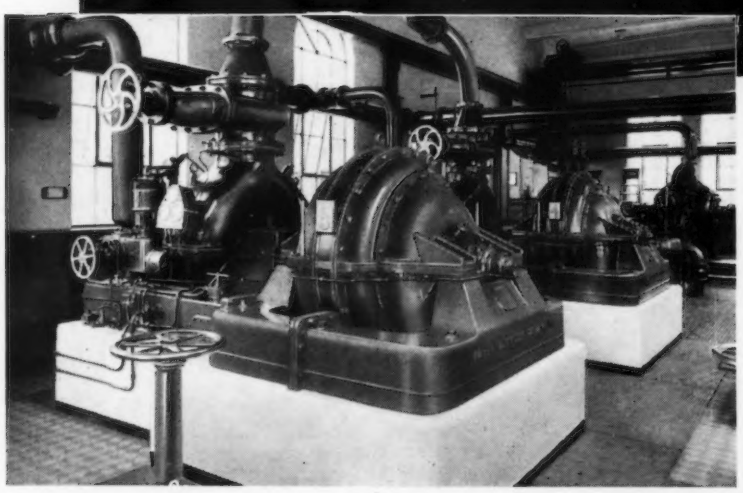

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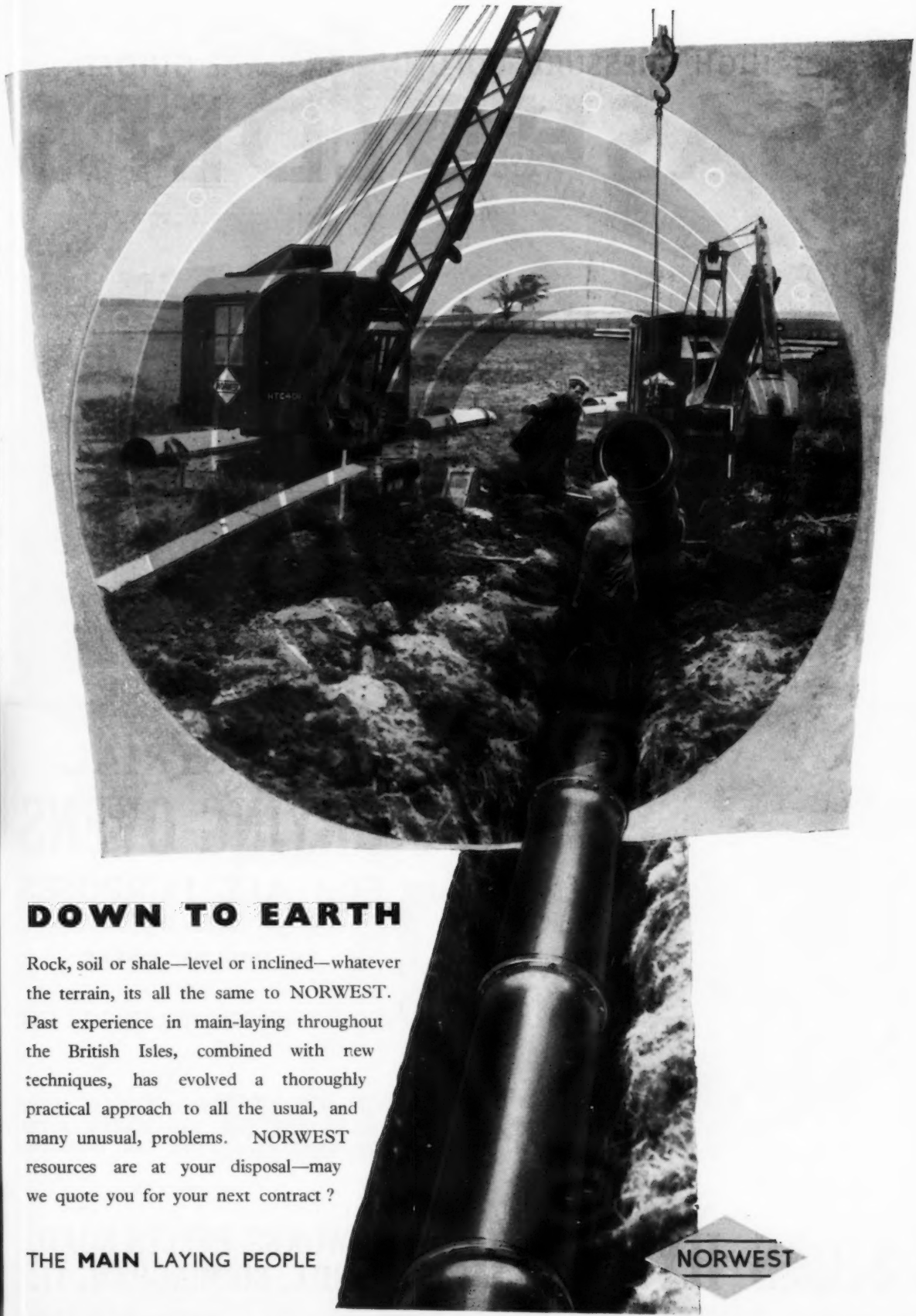

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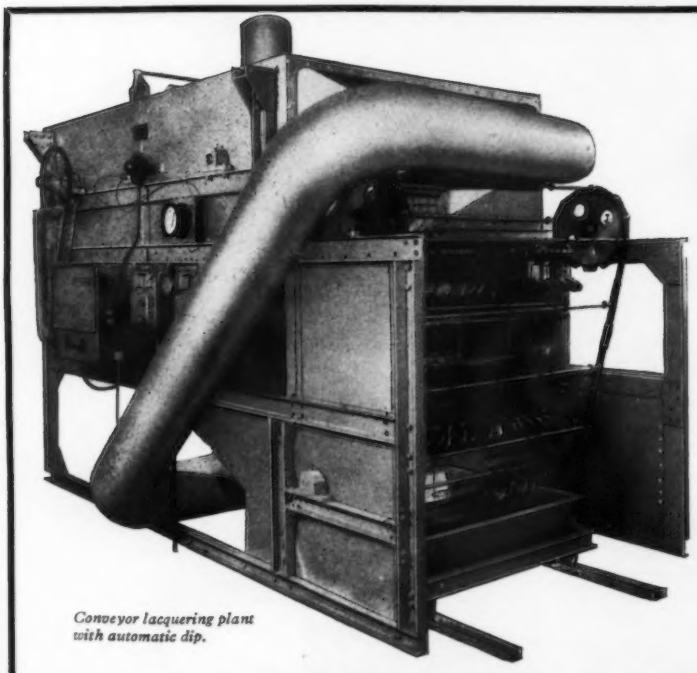

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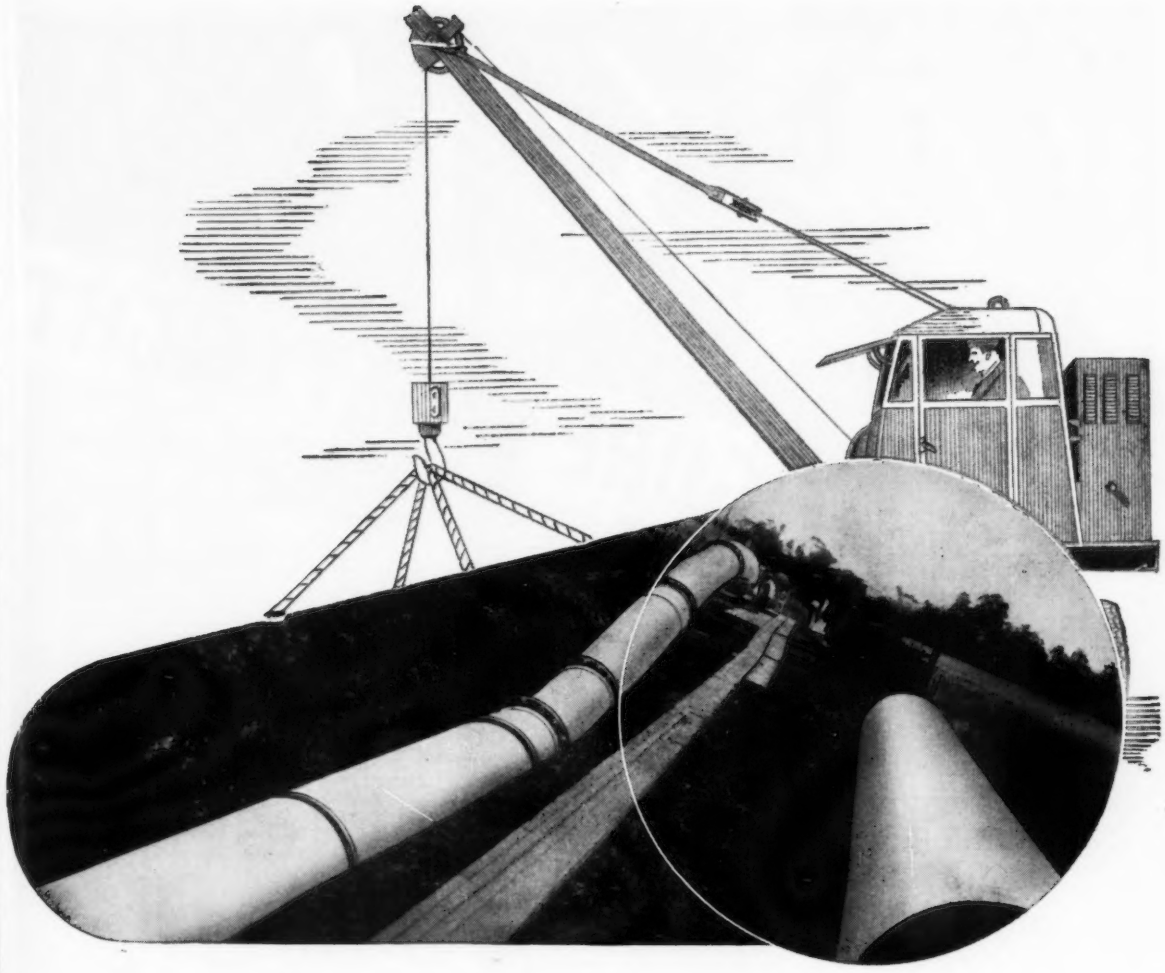

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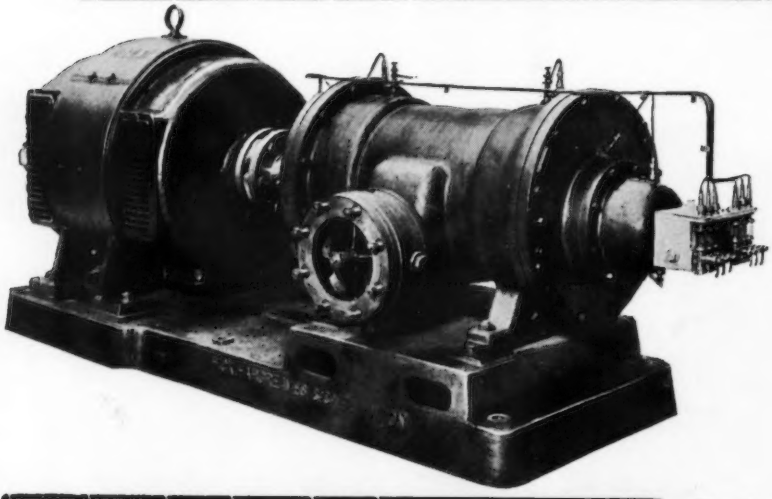

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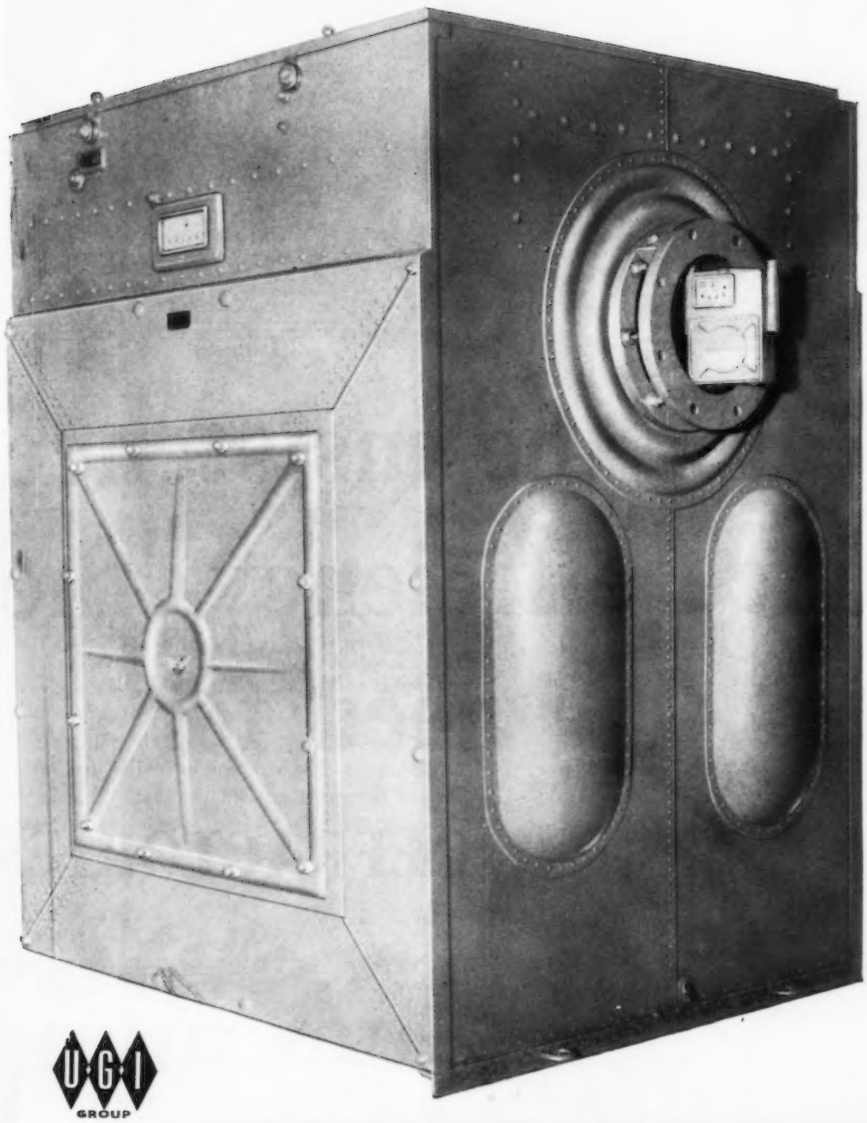
H.1063

100 cu. ft. — 70,000 cu. ft. per hour

The measure of WILLEY service in meters



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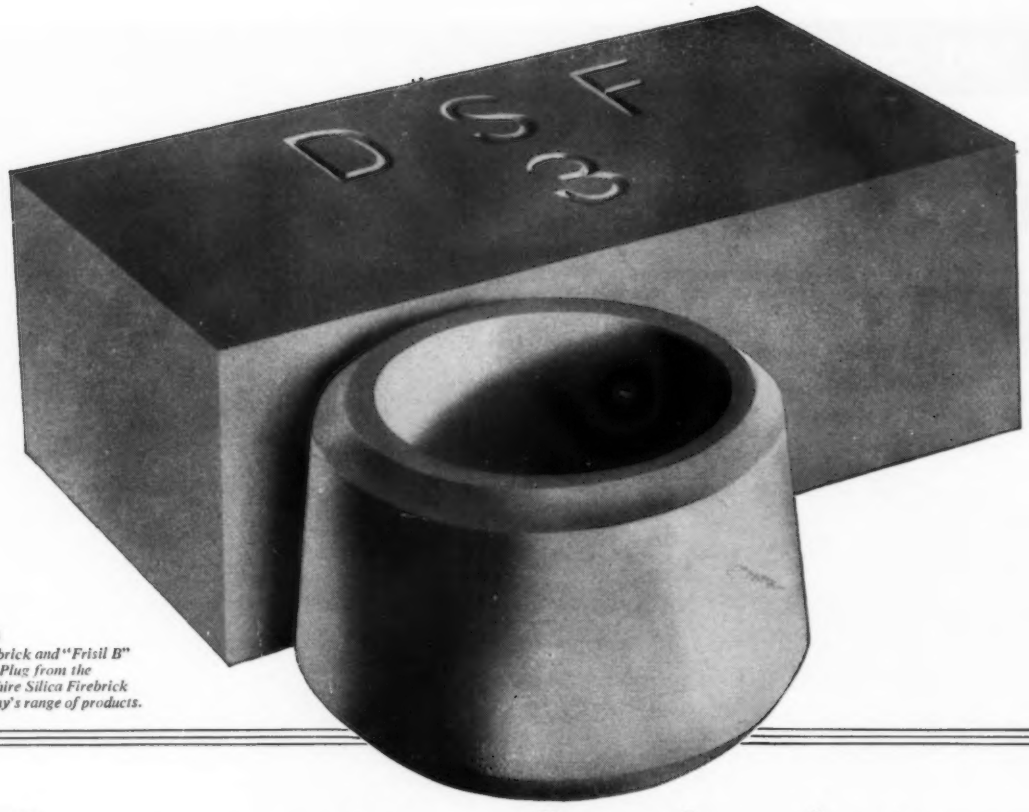

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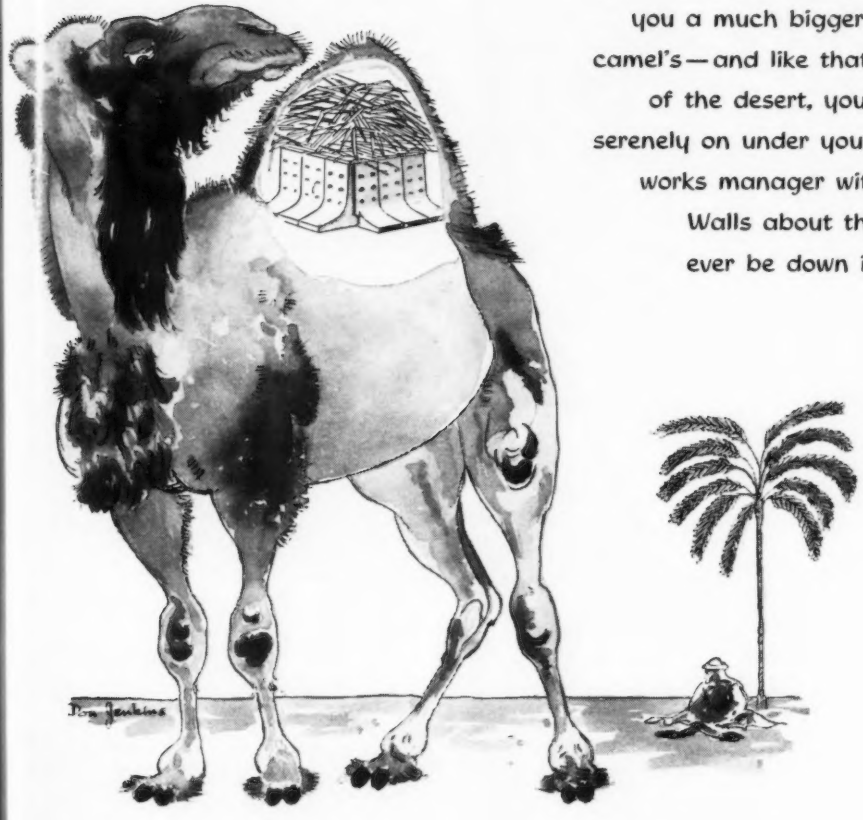

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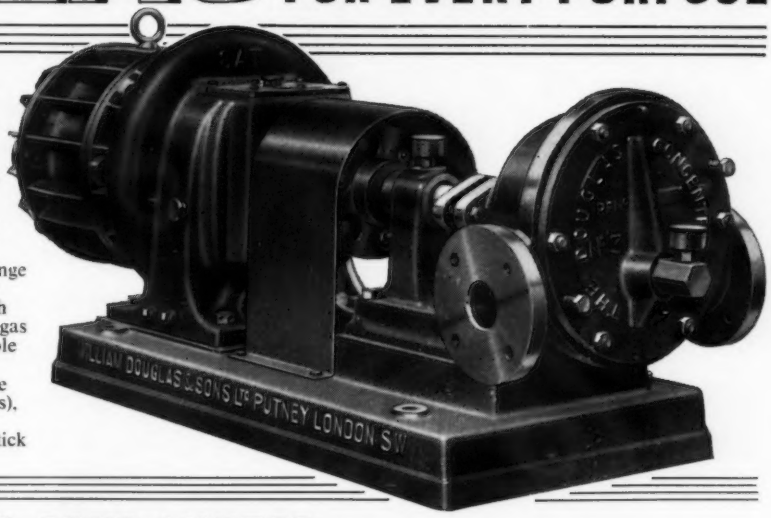

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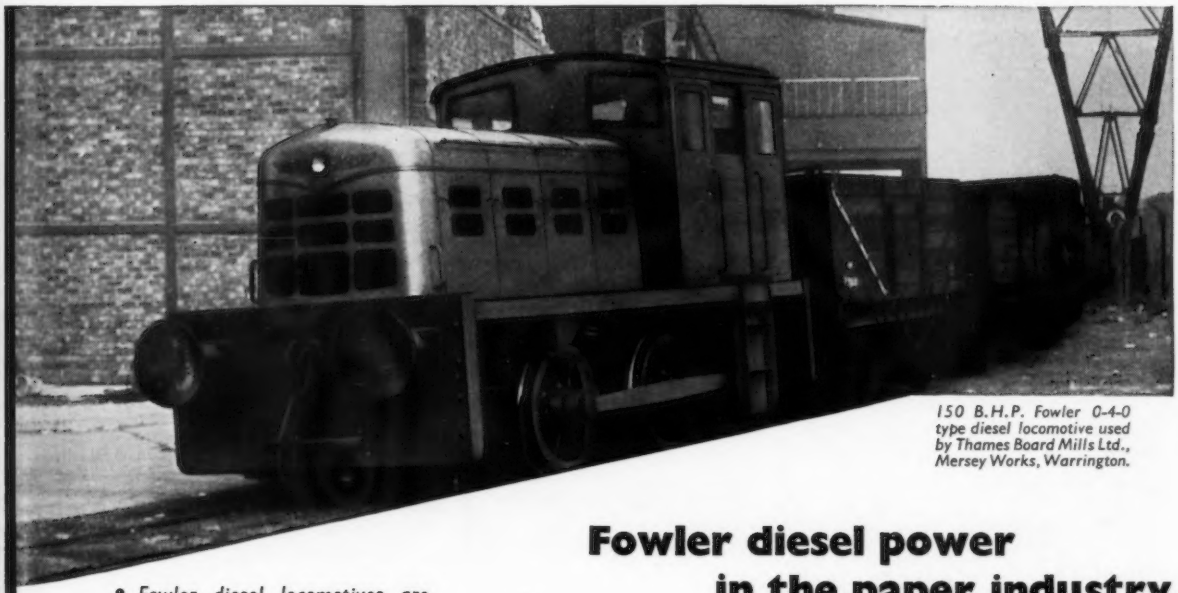

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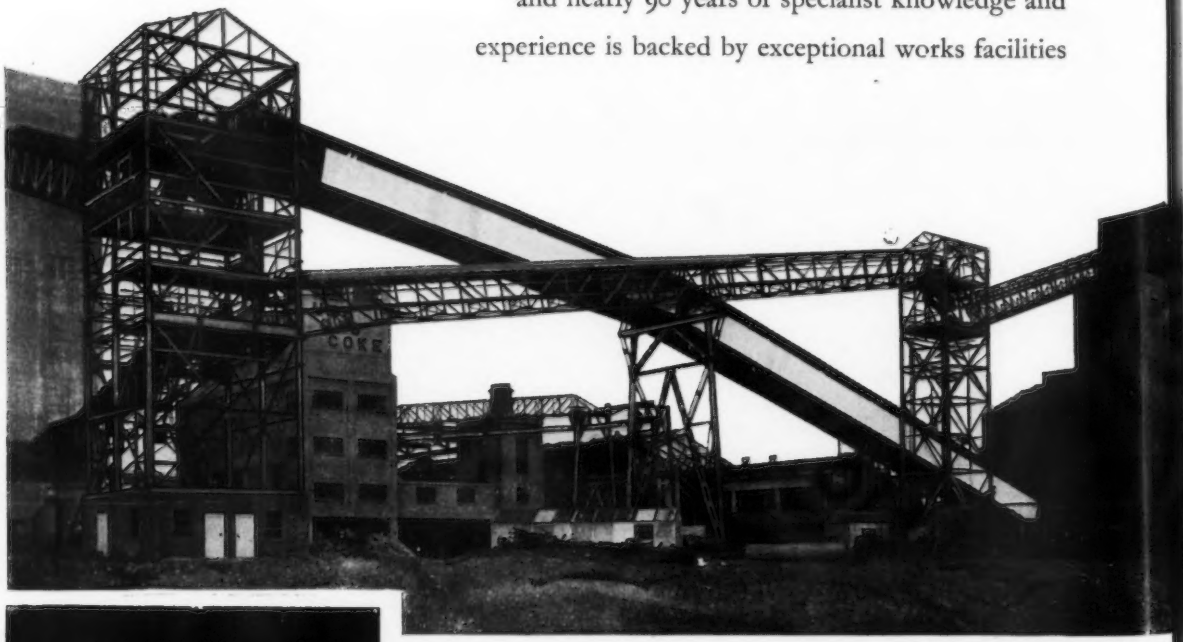

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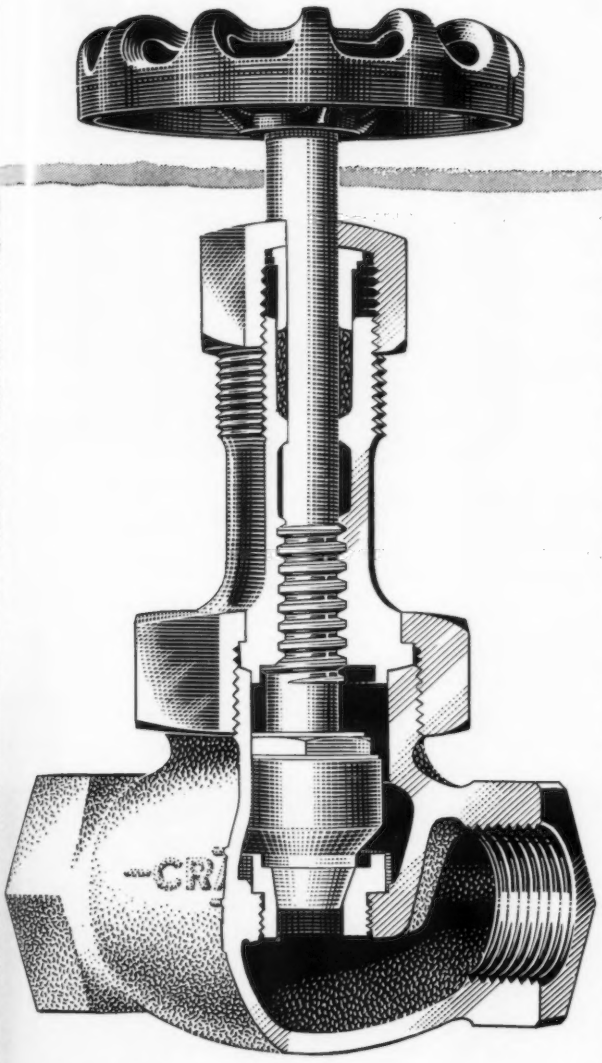

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with renewable Nickel Alloy Disc and stainless steel seat ring

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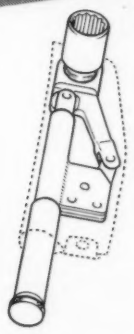

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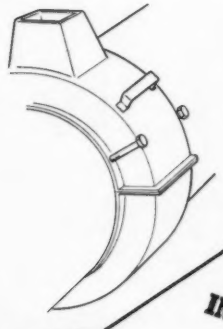

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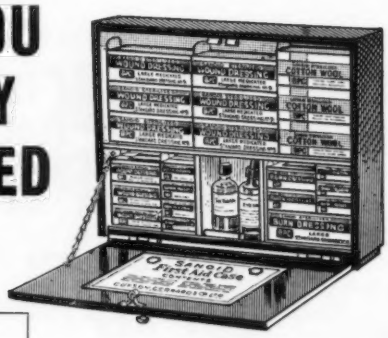

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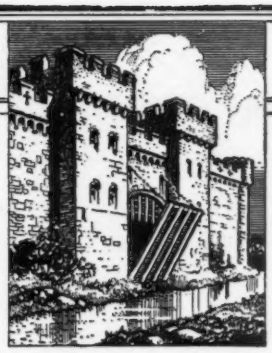

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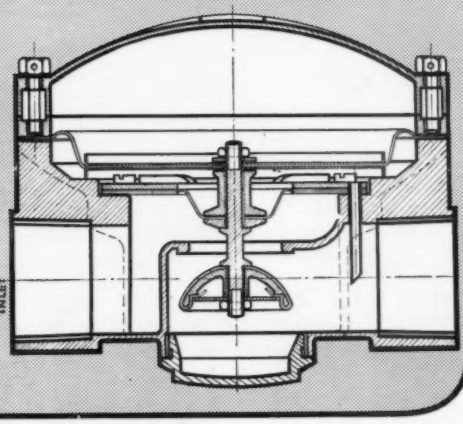

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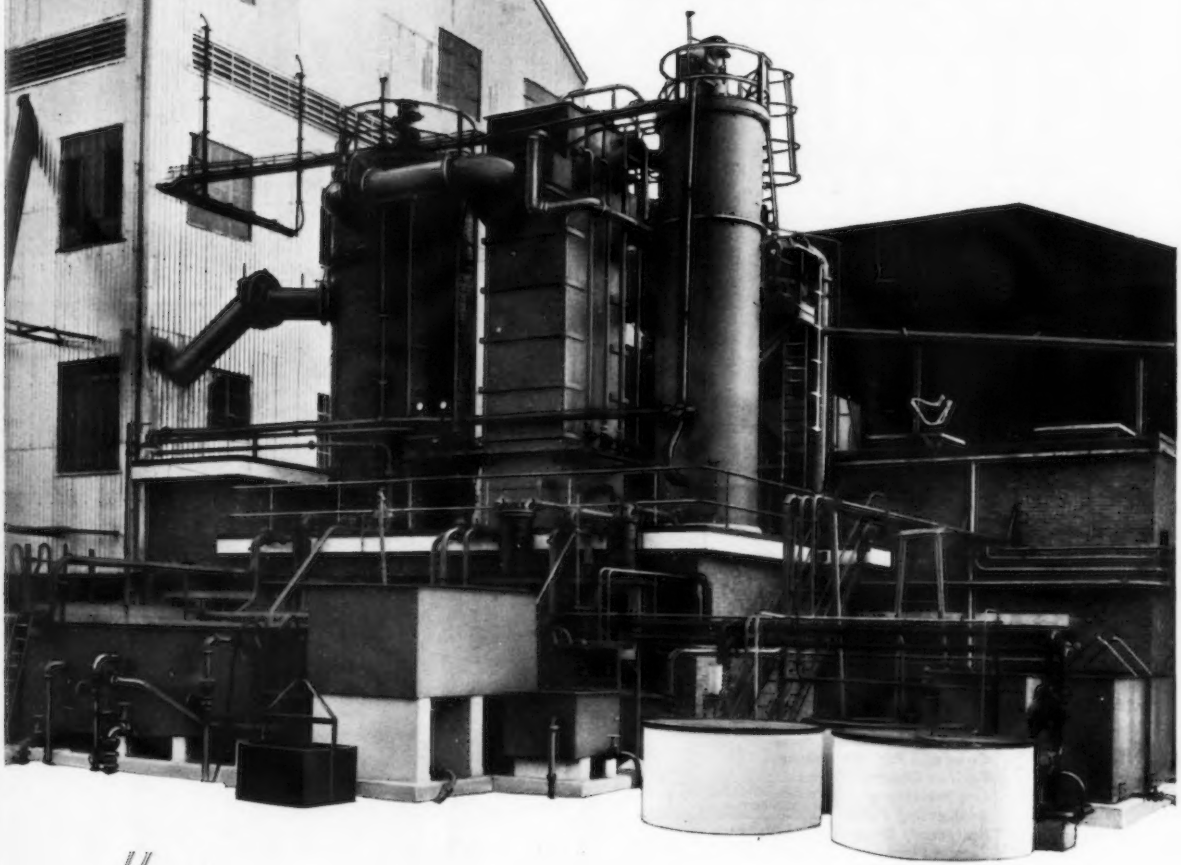

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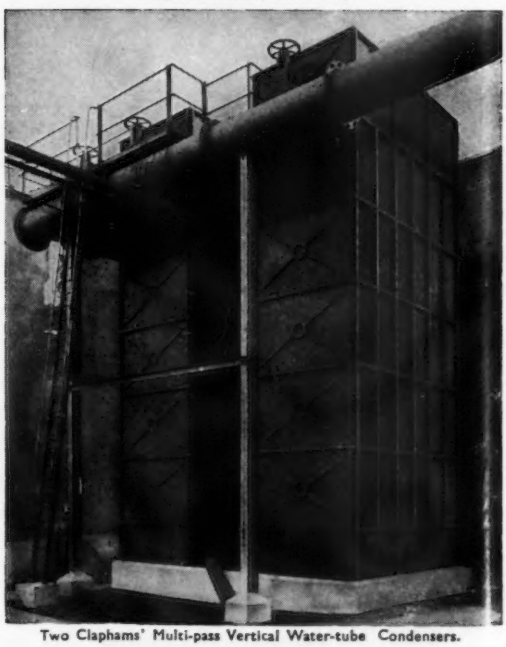

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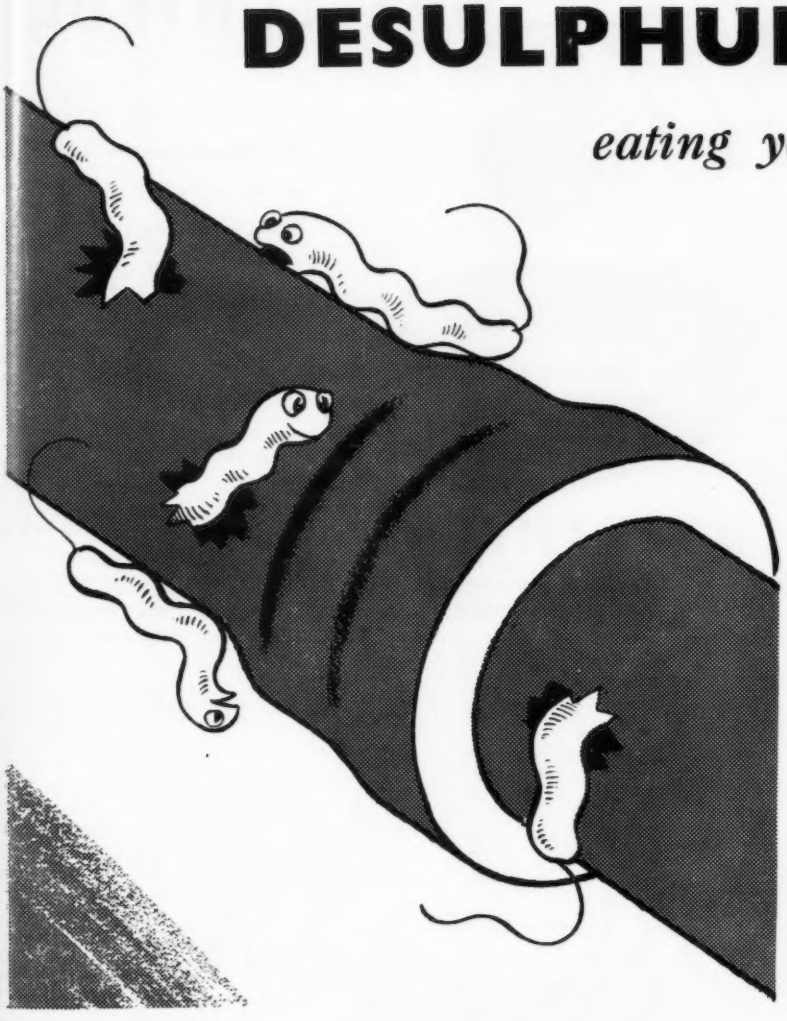

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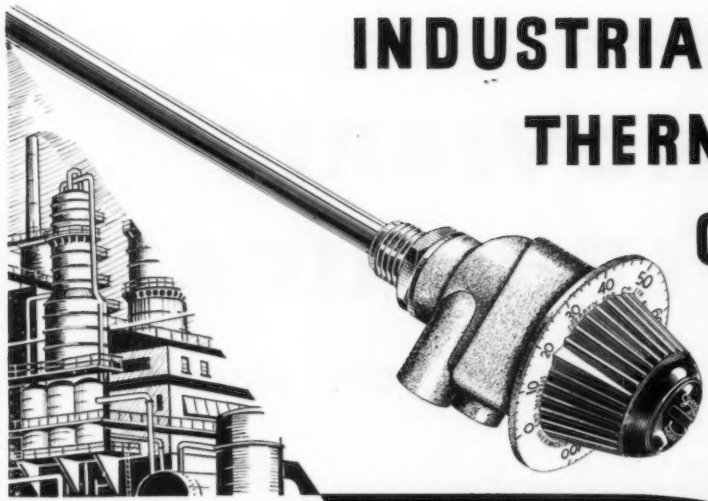

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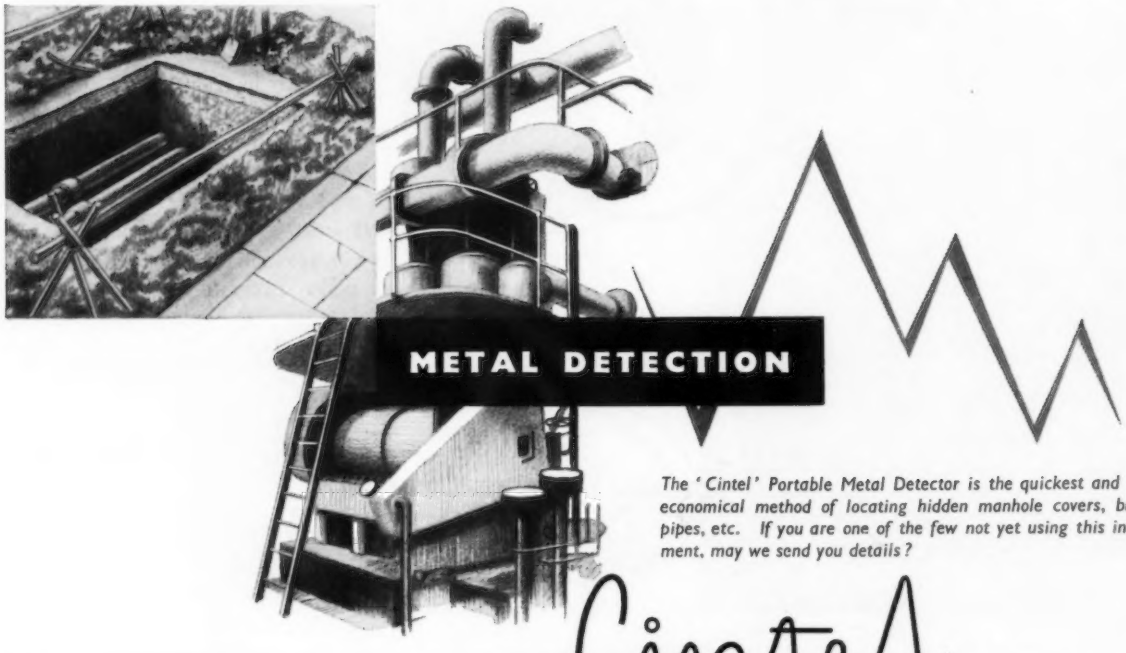

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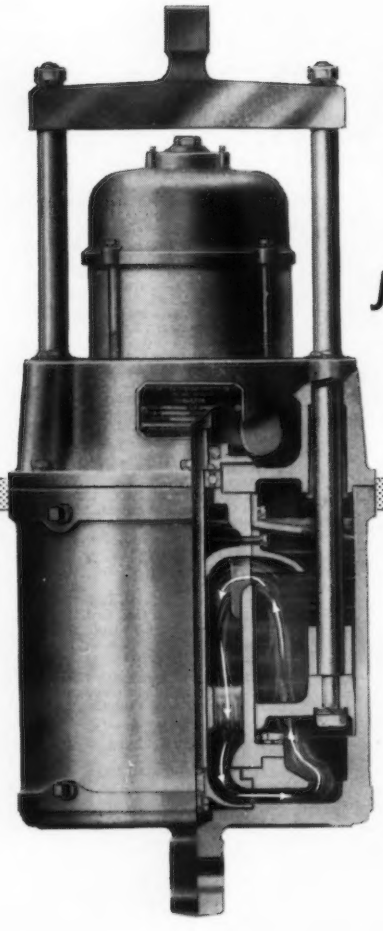

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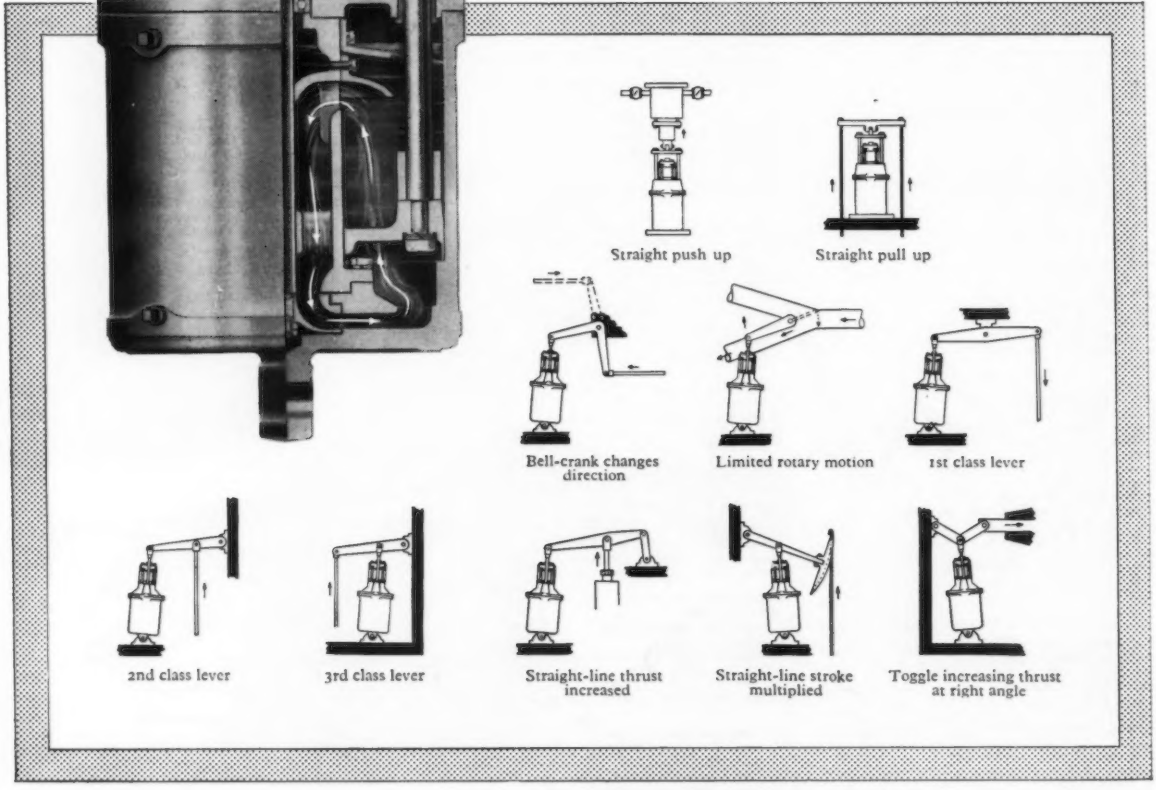

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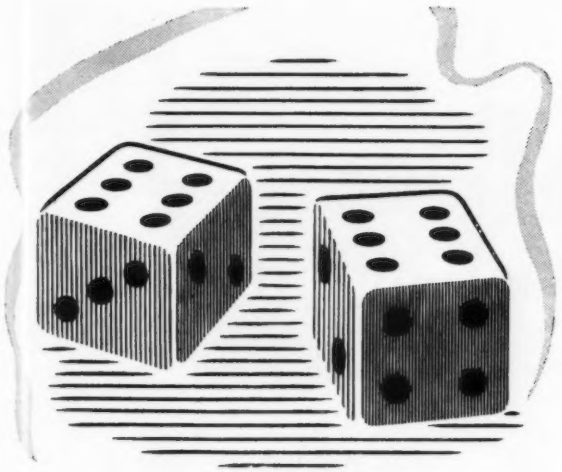

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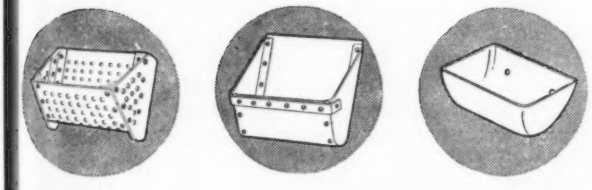

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Gas Journal

VOL. 286 NO. 4846 May 30, 1956

108TH YEAR

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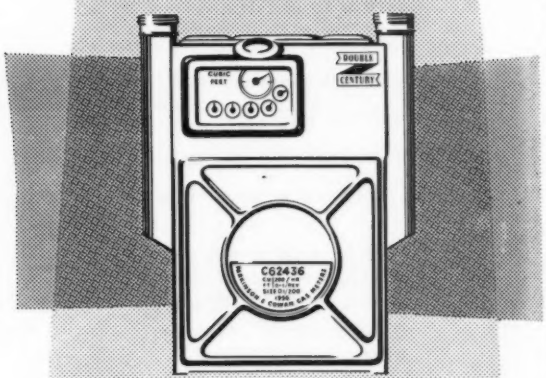

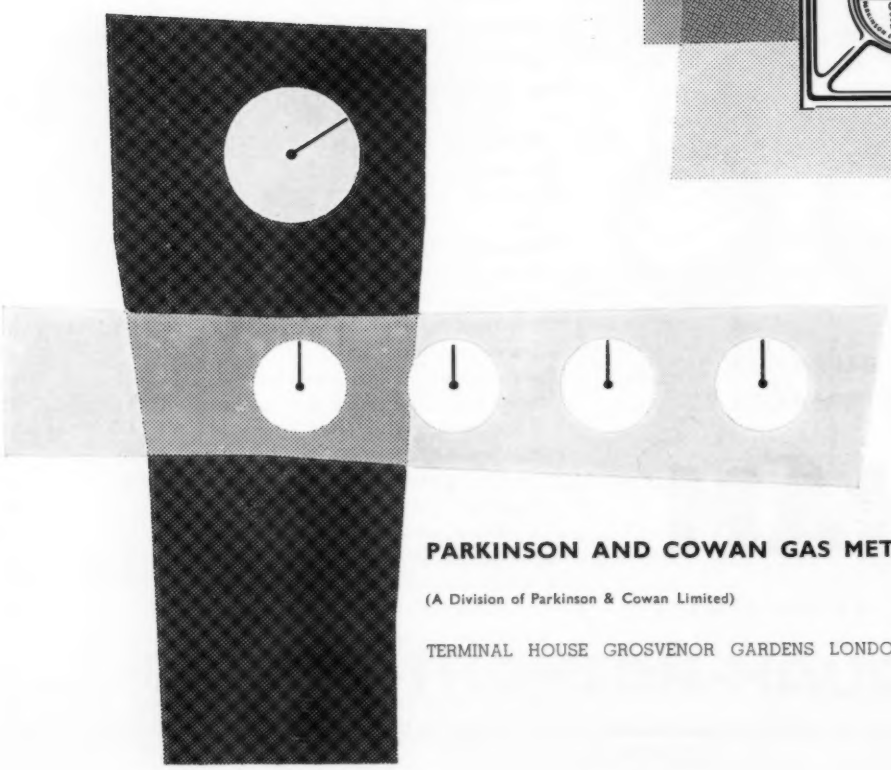

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Gas Journal

VOLUME 286. No. 4846. MAY 30, 1956. 108th YEAR

The Role of the Publicist

LIFE is full of necessary embarrassments. One of ours is the flood of periodicals which cascades over the editorial desk in a never-ending stream. There are the more responsible newspapers, the glossy confections of our competitors, gas magazines from the States, Canada, Australia, New Zealand, France, Germany, and Heaven knows where else, petroleum, electricity and chemical journals, and many more besides. The smallest of them, and therefore the one most likely to be overlooked, is *Thermfare*, the journal of the British Gas Staff Association, which runs to a modest 16 pages, and is what is generally classed as 'pocket size.' However, despite its modest appearance, we always make a point of reading the *Thermfare* editorial because it has two major virtues—it is often interesting, and it can be read in less than three minutes. This month, under the title 'Wrong Either Way,' there appears a complaint that the nationalised industries are not doing enough to put over the story of their achievements to the public. We noted it particularly because we had been considering taking a somewhat similar theme in this column. That *Thermfare* has beaten us to it does not matter in the least; but it shows that our feelings of disquiet on this subject are shared by others.

Let us see what the B.G.S.A. journal has to say. First it suggests that critics of nationalisation are too often allowed to go unanswered, and as a consequence an insufficiently informed public is getting the impression that it is being ill-served. People who should know better are creating an atmosphere of prejudice against those running the various services, and doing all they can to foster the belief that state-run industries must, of necessity, be inefficient and the employees inept. The writer feels that it might be possible to satisfy some of the critics some of the time if they were a little more consistent in their demands. Should heed be taken, for example, of those who suggest that increases in the nationalised services' charges are causing an inflationary spiral, or should the voice be heard of the Herbert Committee on the electricity industry which says, in effect, that the selling price policy is too low and commercially unrealistic? Should the critic who complains that London gas and appliance prices are different from those in Lancashire have his own way and have nationally standard prices, or should note be taken of those who aver that we are a soulless monopoly, having no regard to local circumstances?

The leader goes on to ask whether we should respect the opinions of those who say that gas showrooms are dingy and uninviting, or make improvements and risk the charge of building lavish emporiums at public expense. And so on. Finally, having admitted that nationalised services can make mistakes and that despite progress we are still short of the desired optimum of service, the leader winds up with the stated conviction that if we pursue a firm course we shall reach the required standard in time. 'Meanwhile,' it concludes, 'we should be firm with those gentry who feel that any stick is good enough to beat the nationalised dog.'

There is a good deal of truth in all this and, concentrating on gas alone, we would like to take the matter a stage further—to the stage at which it is generally recognized that the future of the industry depends on the publicity given to it by everybody who relies on the manufacture, distribution and utilization of gas for their livelihood. There is a great danger that gas may be dismissed as an outdated fuel, at any rate on the domestic front. For the moment we are not concerned with the question of cost (which is sometimes put forward as a convenient excuse for lost business, the public showing an astonishing lack of cost-consciousness in other directions) or with such matters as appliance efficiency, etc. We are thinking only of the impression the industry makes on the public. It is of the utmost importance that the man in the street should come to think of the gas industry as one which seems to be getting somewhere, thinking up new ideas, devizing better ways of serving its consumers, and freeing itself from the stigma of nationalised neurosis.

As we see it, the comparative failure of the gas industry to achieve this high reputation is due, more than anything else, to a conviction held by those in high places that publicity is a necessary evil, allowed to be carried on by a small and often not very important department which must mind its own business and have fun with cookery demonstrations. Gas engineers do not consider that their activities could or should be publicized. It is, they feel, a degrading business and a shocking waste of time. They are wrong. At no time since the industry's inception has there been such a

period of inventiveness, of seeking out new processes, and of adjustment to changing conditions. In the right hands these achievements could have great propaganda power. To date only one area board has begun to explore this rich opportunity. There should be Press conferences; the benefits of new developments should be translated into terms readily understood by the public; wherever possible the drama of the situation should be emphasized. We know perfectly well that such a suggestion is poison to the majority of our readers. Their attitude is quite understandable, but unless we are hopelessly wrong, they will have to resign themselves to a greater share of the limelight in future.

Take natural gas—a subject which has aroused a good deal of interest, mainly because the undertaking of a search for it was properly publicized by the Gas Council. If the search is successful there will be a superb opportunity to capitalize on the situation. Since we seem to detect a good deal of activity in the Filey area at the moment, it may be the opportunity is near at hand. Although less dramatic there are other developments in the industry which, properly presented, could give worthwhile publicity to gas. We need that publicity and need it badly. May we plead, therefore, for a better appreciation of the value of this type of publicity and for the responsibility for putting it over to be placed in the hands of competent men who know their job. Finally, returning to the *Thermfare* editorial, let us see that whatever the prejudice existing against nationalisation as a whole, the gas industry proves itself different. And that means that everyone in the industry must be his own public relations officer.

Opencast Coal Mining

IT is as well that the Government has now recognized that opencast coal mining operations will have to remain in operation at least until 1965. Failing some dramatic increase in deep-mining output—and it seems clear that this is not to be looked for—every additional ton of coal that can be won by this means is urgently needed both by the country in general and, until dependence on coal can be diminished to a very marked extent, by the gas industry in particular.

The Government's acceptance of the need for the continuance of opencast mining should pave the way to more efficient operations. Ever since it was introduced as a wartime emergency measure using U.S. Lend-Lease equipment, this branch of the industry has continued as a temporary expedient, its life dependent on the continuance of the fuel gap which, it was hoped, would be ended quickly as deep-mining output caught up with demand. This happy state of affairs has, of course, never come to pass.

This temporary status has had a two-fold adverse influence on opencast operations. The U.K. manufacturer has been reluctant to embark on production of the costly draglines and other heavy equipment involved, with the result that hard currency has had to be expended in purchasing this gear from America—and this despite the fact that there is a wide market for it in different parts of the Commonwealth. Also, doubts about the future of opencast has had a delaying influence in site clearances as the opposing claims of the coal industry, agriculture, and local interests have had to be reconciled. Official recognition of the continued need for opencast coal winning should induce the planning authority to give greater consideration to the industry in dealing with the question of future site clearances. There should be help, too, from the Coal Board's assurance that its standards of reconstruction are now such that no permanent damage is done to the land it works—though it is to be hoped that time will bear this assurance out.

Opinion seems a little divided as to just what contribution to the country's fuel needs opencast mining is likely to be able to make 'Investing in Coal' suggests 10 mill. tons a year. The Coal Board's Opencast Executive holds out hope of half as much again. Perhaps it is not over optimistic to accept the latter figure as the more probable of the two. Over 11 mill. tons were won last year, and this year's figure—already better than last year's at the same period—is expected to be over 12 mill., with a target of 14 mill. two years hence.

In addition efficiency among the Board's private contractors who carry out the work is said to be as high as anywhere, competition among them is known to be keen, and the size of contracts is on the increase, the new site in Westfield, Scotland, being the largest in Europe. The outlook may, therefore, be described as encouraging.

B.C.I.A. Appliance Testing

IT is extraordinary the number of people who are setting themselves up as testers of solid fuel appliances. The latest organization to join the party is the British Coking Industry Association which has established a testing station at Acton. When we inspected the station a fortnight ago we found it to be a former British Railways electricity sub-station which the Association have acquired on a rental basis. The great, lofty building had been pleasantly spruced up and at the time contained no more than half a dozen appliances under test. However, a fairly ambitious programme is planned and in due course more of the space will be utilized. Then perhaps it will no longer be necessary for the staff to be warmed by the portable Schwank burners which, by providing individual heat, kept them from a frozen end in recent months.

Some two years ago, when the Beaver Committee was still sitting, the British Coking Industry Association felt that the time had come when it should take on behalf of its members, the makers of coke in coke ovens, more positive action than hitherto on the use of hard coke in domestic appliances. It was obvious at that time that clean air legislation would eventually be enacted and that in the light of such legislation increasing quantities of hard coke of the right type would need to be produced for home consumption. At about the same time the Association, through the Solid Smokeless Fuels Federation, became a party to the list of recommended solid fuel appliances which it sponsored jointly with the Coal Utilization Council. While two or three laboratories in the hands of the National Coal Board and the British Coke Research Association were interested in hard coke as a domestic fuel, their efforts were mainly of a research character, and remain so. The necessity for a further laboratory in which appliances could be tried out using hard coke as a fuel became more and more important. That is how the station came into being, designed to examine as many and varied household solid fuel burning appliances as possible, always using hard coke as the fuel.

Personal Notes

MR. R. H. SANDFORD SMITH has been appointed Deputy Chairman of the South Eastern Gas Board. Educated at Haileybury, Mr. Sandford Smith began his business career by spending six years on the Stock Exchange. In June, 1932, he qualified as a chartered secretary, winning the Sir Ernest Clarke prize in the final examination. In October, 1932, he was engaged by the Gas Light and Coke Company and worked in several sections of the Accountant's department. When a separate organization was set up for the South Eastern Gas Corporation, Ltd., in 1934 he was seconded to this work and was appointed Secretary of the Corporation in 1939. On the formation of the South Eastern Gas Board in January, 1949, he was appointed Acting Secretary, and later became Secretary. Mr. Sandford Smith is married, and has one son. He is interested in books and the theatre. Other recreations are golf, tennis, and, more recently, gardening.

MR. PHILIP W. B. KING and MR. SIDNEY T. CULLEN have joined the Board of Directors of Walter King, Ltd., Publishers of the 'GAS JOURNAL.' Mr. Philip King, who joined the firm in 1948 on completion of Army service in which he was commissioned in the Essex Regiment, was appointed Northern Manager in 1954. Mr. S. T. Cullen's whole working life has been with the Company, which he joined in 1924 at the age of 16. In 1927 he was assisting the late J. A. Morris in the Advertisement Department, and a few years later was made responsible for space selling in the North. He took over the department on Mr. Morris's retirement in 1936 and guided it through the difficult 'space rationing' years of the war. He was appointed Business Manager in 1946.

MR. W. J. COLLINS GARRARD, Divisional General Manager of the Ipswich Division of the Eastern Gas Board, is retiring on June 30. MR. R. WHITING has been appointed Divisional General Manager in place of Mr. Collins Garrard with effect from July 1. MR. W. E. PRITCHARD has been appointed Assistant Industrial Relations Officer with special duties in connection with education and training.

MR. R. BAIRSTOW has been appointed Assistant Engineer, Bow Common; MR. G. F. I. ROBERTS, Assistant Engineer, Brentford; and MR. L. W. BARNES, Office Manager, Mid-Essex Division, the North Thames Gas Board announce.

Obituary

MR. FRANK GEORGE WATSON, who was for many years Secretary of the Bognor Regis Gas and Electricity Co., Argyle Road, Bognor Regis, Sussex, and, after nationalisation, continued in the employ of the Portsmouth, Gosport, and Bognor Regis Gas Undertaking until his retirement, died on May 12, after a long illness, aged 78. His service to the gas industry had lasted for 41 years.

MR. JAMES BEOCHER, Chapel Street, Aberfeldy, who has died at the age of 80, was, previous to his retiral some years ago, Gas Manager of the Aberfeldy Gas Company. He was at one time Gas Manager at Keith.

AUSTRALIAN GAS COMPANY PAYS HIGHER DIVIDEND

FOLLOWING 'excellent' trading results in 1955, the Chairman of the Australian Gas Light Company, Mr. C. G. Crane, said at the annual general meeting in Sydney last March:

'We are in a position to pay the higher rate of standard dividend at 6½% per annum now authorized, for the first time, under the amended Gas and Electricity Act. To pay this dividend for a full year on an additional £500,000 capital raised by the issue of shares in October, 1954; and after making adequate provision for taxation, we have a surplus of £21,032. This latter amount, together with that available from the previous year's operations, makes a total of £301,655 to carry forward, which is sufficient to cover the dividend at the current 6½% rate for a period of approximately ten months.

'For ten and a half months of last year we were able to maintain the price of gas at the reduced level which the company voluntarily decided upon in 1953. It was only on November 19 last, that we were forced by a further general increase in costs of raw materials and labour to restore the price of gas to the authorized standard price.'

During July the amount of gas issued from the Mortlake works had been a record of 58,476,000 cu.ft., 50% greater than the maximum daily issue in 1945, the Chairman continued. The popularity of gas for cooking had been confirmed by another remarkably successful 'Old Stove Round-up' campaign during which, in addition to sales by retailers, the company itself had sold 7,500 modern gas ranges during three months.

Diary

June 2.—SCOTTISH JUNIORS (EASTERN DISTRICT): Annual Outing to Perth.

June 4.—WEST MIDLANDS G.C.C.: Committee Room, Gas Offices, Edmund Street, Birmingham 3. 2.30 p.m.

June 5.—SOUTH EASTERN G.C.C.: Caxton Hall, London. 11 a.m.

June 5-8.—NATIONAL AND LOCAL GOVERNMENT OFFICERS' ASSOCIATION: Annual Conference, Usher Hall, Edinburgh.

June 6.—SOUTHERN G.C.C.: 28th Quarterly Meeting, The Assembly Room, Oxford Town Hall. 11.0 a.m.

June 6.—NORTH WESTERN FUEL LUNCHEON CLUB: 'Coal in the Atomic Age,' E. F. Schumacher, Economic Adviser to the National Coal Board. Engineers' Club, Manchester. 12 o'clock for 12.45 p.m.

June 7.—SOUTH WESTERN G.C.C.: 34, Bridge Street, Taunton, 11.0 a.m.

June 8.—SCOTTISH JUNIORS (WESTERN): Golf Outing.

June 14.—INCORPORATED PLANT ENGINEERS: Brains Trust, 'Fuel and the Future,' The Royal Institution, Colquitt Street, Liverpool, 7.15 p.m.

June 14.—MIDLAND JUNIORS: Ladies' Day. Visit to Derbyshire Silica Firebrick Co. Ltd., Friden.

June 14 and 15.—EASTERN SECTION, I.G.E.: Annual General Meeting. Chairman's Address. Paper, 'Gas in the Rural Areas,' J. T. Brookes, Great Yarmouth.

June 15.—WALES G.C.C.: Guildhall, Swansea. 11.0 a.m.

June 16. — MANCHESTER JUNIORS: Ladies' Day, Windermere.

June 16.—WESTERN JUNIORS: Summer Meeting and Ladies' Day, Dartmouth.

June 16.—SCOTTISH JUNIORS (EASTERN): Golf outing. Balwherrie, Kirkcaldy.

Coke Prices Must Follow Coal Up, Says Gas Council

FOLLOWING the National Coal Board announcement of higher coal prices, the Gas Council has made this statement:—

'Consequent upon the 8% increase in the price of coal, which will increase the gas industry's annual coal bill by about £8½ mill., it will be necessary to increase gas coke prices throughout the country by 9s. per ton except in the area of the West Midlands Gas Board where the increase will be 8s. 4d. per ton, as from June 1.

'The necessary amendments to maximum retail prices for the Retail Coal Prices Order, 1941, will be made as from that date.'

British Oil Gas Plant to be Installed in Far East

A CONTRACT worth about £180,000 has been awarded to Humphreys & Glasgow, Ltd., London, by the Singapore City Council to modernize the Singapore gasworks.

Existing carbonizing and water gas plant is to be replaced by oil-gas and there will thus be a need for only one basic raw material—heavy oil—which will replace the coal, coke, and gas oil now used.

Humphreys & Glasgow, Ltd., will build three sets of regenerative plant utilizing the Onia-Gegi catalytic process. Each set will have a daily capacity of 1.5 mill. cu.ft. When completed two sets will operate and the third will act as a standby. The plant will be sited in the open, but machinery and controls will be housed in an adjacent building. Existing purifiers and ancillary plant will remain in use. The first set will probably go into operation in about 18 months' time.

Japanese Order

Another overseas order for Humphreys & Glasgow, Ltd., has been placed by the Osaka Gas Company, Japan, for two large carburetted water gas plants for their Kyoto works.

The installation will have a total daily capacity of 200,000 cubic metres of 470 B.Th.U. gas, i.e., about 7.5 mill. cu.ft. Heavy oil will normally be used for enrichment and the plant will help to absorb some of Japan's surplus coke.

Some of the material will be fabricated to Humphreys & Glasgow design in Tokyo. Special equipment will be supplied from the U.K. The plant will be put into operation in about 16 months.

The President of the Osaka Gas Company, Mr. Iguchi, visited a number of Humphreys & Glasgow installations during his tour of Great Britain.

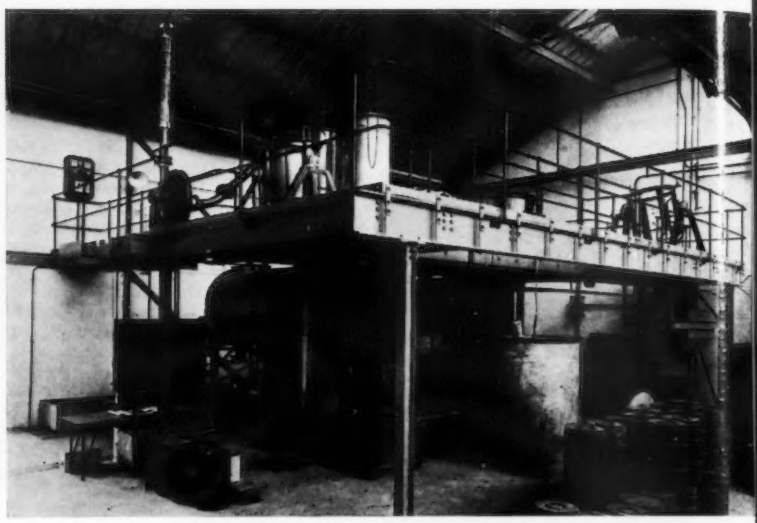
On the Home Front

On the home front, Humphreys & Glasgow, Ltd., have been awarded two contracts by the East Midlands Gas Board to build catalytic oil gasification plant utilizing the Onia-Gegi regenerative process.

At Meadow Hall gasworks, Sheffield, two units will be erected adjacent to existing water gas plant, each unit having a daily capacity of 5 mill. cu.ft. of town gas. The oil gas plant will be used in the first instance only as a standby plant for heavy load periods.

At Northampton gasworks, Humphreys & Glasgow will erect two oil gasification units on the site of an old retort house which is being demolished and is adjacent to a new retort house. Each unit will have a daily capacity of 3 mill. cu.ft. of town gas.

Both the installations at Sheffield and Northampton have been scheduled for operation in the autumn of 1957.



New catalyst manufacturing plant at Billericay of Humphreys & Glasgow, Ltd.

New Catalyst Storage Depot Erected

SAVING IN ONIA-GEGI IMPORTS

NEW premises have been constructed at Billericay, Essex, for Humphreys & Glasgow, Ltd., primarily as an equipment and storage depot, but also accommodating bulk storage of the special catalyst used in the Onia-Gegi process.

The site for the depot was selected primarily because it has good road and rail facilities with easy access to London docks for export. Humphreys & Glasgow have extensive overseas connections to which they export plant and equipment. A private siding has been constructed adjacent to Billericay Station between the main London-Southend (Eastern Section) railway line and the depot. Mechanized plant for off-loading material and equipment is installed.

The depot is equipped with everything necessary for the servicing of construction equipment and tools and is stocked with contract materials in short supply. It has, furthermore, facilities for the assembly of components and for general testing and development work.

Modern Laboratory

Plant for the manufacture of the catalyst used in the Onia-Gegi oil gas process and similar, is an important feature of the new depot. Before the erection of this plant all catalyst material had to be imported from an associate company in France. Now all plant built by Humphreys & Glasgow in the future will be supplied with catalyst prepared in this depot.

A new modern testing and proving laboratory is scheduled to be erected shortly on the same site, and will be staffed by a highly qualified team who will undertake all laboratory scale work in the many fields in which Humphreys & Glasgow's extended activities are concerned.

The construction of the Billericay depot and laboratory is part of an expansion programme by Humphreys & Glasgow Ltd., for undertaking comprehensive installations for the gasification of coal and oil under pressure, and specialized plant for the chemical engineering field.

Fixed Price Tenders

'The civil engineering contracting industry has always been a highly competitive one and we are willing to help in any way we can,' said Mr. A. M. Holbein, President of the Federation of Civil Engineering Contractors, commenting on the announcement by the Minister of Works that the Government proposed in future to invite fixed-price tenders for selected contracts up to a value of £100,000.

'At the same time our ability to tender fixed prices must always depend to a large extent on the nationalised industries and materials supply industries being able to hold their prices,' he added.

U.K. Pipeline for Pakistan

A CONTRACT for the installation of a 212-mile natural gas pipeline in West Pakistan running from the Sui Gas Field in Baluchistan to Multan in the Punjab has been signed by Pakistan Constructors, the joint venture of D. & C. and William Press, Ltd., of London, and Morrison-Knudsen International Corporation Incorporated, of San Francisco, U.S.A., with the Pakistan Industrial Development Corporation. Work is due to start in December.

Ahead of Schedule

The contract, which has been let on the basis of a bid item for each individual operation, is valued at approximately £2 mill.

The outer diameter and wall thickness of the pipe are 16 in. and $\frac{5}{16}$ in. respectively, the same dimensions as the pipe used on the 350-mile Sui-Karachi line, completed ahead of schedule by the same contractors in April of last year.

Fifty per cent. of the pipe for the Multan contract is being supplied by Stewarts and Lloyds and fifty per cent. by Dalmine of Italy.

Two River Crossings

The pipeline route, which was surveyed and determined by D. & C. and William Press, Ltd., runs in an easterly direction initially until it crosses the River Indus at Kashmor. It then proceeds along the east bank of the River Indus, bearing east and then north east, crosses the River Sutlej and thence into Multan. Apart from the two major river crossings, there are numerous canal and road crossings to negotiate.

The managing agents on behalf of the Pakistan Industrial Development Corporation are the Sui Gas Transmission Company, who filled the same rôle on the Sui-Karachi pipeline contract.

It is possible that a decision may be made in the near future to extend the pipeline from Multan to Lahore, a distance of about 200 miles.

Doctor Hits at Gas Poisoning in Scotland

For some peculiar reason Scotland seemed to specialize in poisoning by gas, said Dr. E. Neil Reid, M.O.H. for Stirlingshire, at a meeting of the County Accident Prevention Committee. Deaths from gassing in Scotland were almost twice those in England, he said.

He described as 'amazing' the gross carelessness connected with gas poisoning accidents, and said the shilling-in-the-slot meter was a positive menace and presented many traps for people.

Mr. J. Findlay Russell, Falkirk, said the Gas Board used the most crude methods to stop the flow of gas, and it appeared to him that the whole gas industry was about 50 years out of date. The Board had no record of their mains and did not know where the pipes were laid. Especially was this the case, he said, with old and condemned buildings which still contained a meter and had the gas connected.

Dublin Gas May Be Increased 5d. Per Therm

The Alliance and Dublin Gas Consumers' Company has applied to the Prices Advisory Body for permission to increase the price of gas on June 1.

The original application was for an increase of 4½d. per therm because of the coming increase in the price of coal, but when the body sat, Mr. N. J. Robertson, General Manager of the gas company, asked that the application be amended to an increase of 5d. per therm because of the increased price of oil and petrol arising out of the Budget.

He also said that the amended figure was influenced by the fact that the increase of 4s. 7d. in the £ in the Dublin city rates would mean an additional burden of £6,460 annually on the gas company.

The Prices Advisory Body will report its findings to the Minister.

NEW ZEALAND GAS

The New Zealand Minister in Charge of the State Hydro-Electric Department, the Hon. W. S. Goosman, has declared essential 23 of the 34 gas undertakings in New Zealand. This follows an interim report from the Electricity and Gas Co-ordination Committee, which has still to report on another eight gas undertakings.

Mr. Goosman said this announcement would indicate to the consumers of the 23 undertakings declared essential that their future gas supply was assured.

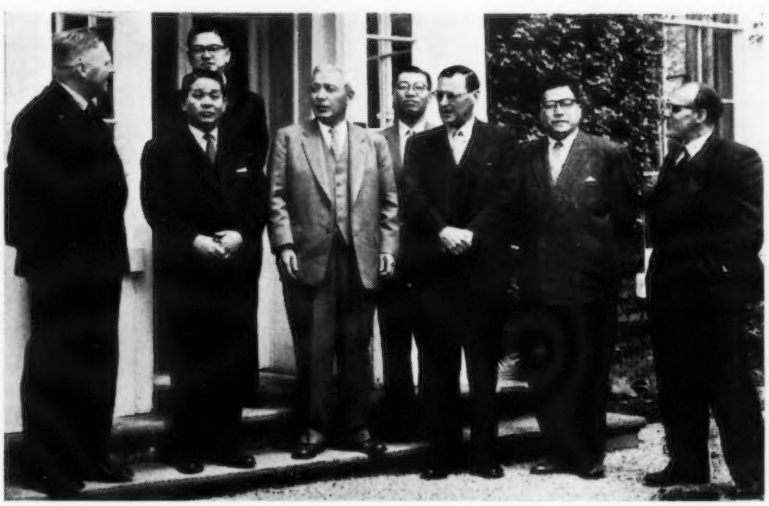
WOLVERHAMPTON DIVISION HOLDS ANNUAL DINNER

THE Wolverhampton Division of the West Midlands Gas Board held their annual dinner and prize presentation at the Station Hotel, Dudley, on April 9.

The Division has for the past six years sponsored a series of competitions designed to stimulate friendship among members of the various branches. Trophies are awarded for each of the competitions, and awards are also given for safe driving.

Presenting safe driving awards to 18 successful drivers this year was Mr. Stanley Jones, Divisional General Manager, who paid tribute to 'what any company would be proud of—an accident free year.'

The first-aid trophy this year went to Stourbridge 'A' team who have yet to compete in the area competitions and, if successful, will represent the division in the all-England final, to be held in June. Runners-up were Stourbridge 'B' team.



Mr. T. Iguchi (fourth from left), President and Director of the Osaka Gas Company, with other Japanese officials, being greeted at the guest house of The Power-Gas Corporation, Ltd., Stockton-on-Tees, by Mr. R. W. Rutherford (third from right), Deputy Managing Director. The visitors are touring the world studying various forms of gasification. A Power-Gas Corporation, Ltd., four-unit 24 mill. cu.ft. per day carburetted water gas plant using heavy oil has recently been completed and handed over in Japan.

THINK AGAIN ABOUT SIMPLE HIRE, CHANCELLOR TO BE ASKED

N.W.G.C.C. Meeting Told of Intended Approach

THE Minister of Fuel and Power is to be asked to make representations to the Chancellor of the Exchequer to reconsider the restrictions on simple hire of gas cookers. Councillor Mrs. W. M. Mitchell (Preston) told members of the North Western Gas Consultative Council meeting in Salford that these restrictions had caused cases of hardship.

Councillor G. W. Sealey (Liverpool) said that local authorities were having to buy gas and electric stoves for their tenants. The alternative would be to instal the old type grate which would be more expensive than a cooker, and, as another member pointed out, not in keeping with the drive for smoke abatement.

Promotional Tariffs

The setting up of a promotional domestic tariff once again came up for discussion. Councillor F. H. Smith (Hoylake) said that a two part tariff had worked with electricity so why not with gas? He suggested that there should be a standard basic charge of 15s. a quarter and then 1s. for every therm used. Mr. R. M. Bradburn (Birkenhead) said that until the market for increased domestic sales was created there would be a loss on such a tariff. The chairman, Alderman C. E. P. Stott, said a policy of 'safety first' never got anyone anywhere.

Dissatisfaction

Dissatisfaction was expressed on the explanation given at the previous meeting by the Gas Board Chairman on the Board charge of 10s. 0¾d. an hour for installation as against 6s. 8d. by private contractors. A resolution was adopted suggesting that the charges made by the Board should embody the costs which properly should be a general charge on the industry. A resolution was also passed urging the Board to consider very seriously the use of gas and coke for space heating in schools, hospitals, and institutions in order to combat competition from oil.

Alderman W. Onions (Manchester) said that gas charges were too high: £24,000 a year had been quoted for gas heating in a new building, compared with £10,000 a year for coal and £14,000 for oil.

Alderman Stott, who has been Chairman of the Council since its formation on nationalisation, presided for the last time before the expiration of his term of office. Tributes of appreciation to him were voiced.

Mr. D. S. Davies, Engineer and Manager of the Abertillery undertaking of the Wales Gas Board, leaps into action while refereeing the recent fight for the Welsh Light Heavy Weight Championship between Gwyn Rowlands and Noel Triggs. Mr. Davies is an A class referee and has handled a number of championship fights. He is the only recognized British Boxing Board of Control referee in the gas industry.

Argentine Orders British Plant

IN the face of world competition, Whessoe, Ltd., Darlington, have secured an order from the Argentine State Gas Department for two W.W-D. electro-detarrers for Buenos Aires. Competing firms were from Germany, France, and the U.S.A. as well as from this country.

The detarrers, which are 9 ft. in diameter, are complete with two high tension transformer-rectifier sets, each of 180 MA at 33 KV. The complete plant has a capacity of over 1 mill. cu.ft. per hour of water gas measured at S.T.P. and treated at approximately 40°C. The plant has to conform with a rigid specification drawn up by the Buenos Aires Gas Department and will be subject to a stringent guarantee test.

This order follows a previous contract from the Buenos Aires Gas Department in 1948 for two W.W-D. electro-detarrers for the treatment of 13 mill. cu.ft. per day of water gas. These two detarrers have given every satisfaction.

Both contracts were negotiated by the Whessoe representatives in the Argentine, British Structural Steel Co., Ltd.

N.E.G.B. MAKES GOOD PROGRESS IN GUARDING AGAINST PRESSURE FALLS

FOLLOWING concern expressed in several Yorkshire towns regarding incidents arising from low gas pressures, it was stated by Mr. George Currier, Deputy Chairman, N.E.G.B., at a meeting of the North Eastern Gas Consultative Council, in Leeds, recently, that good progress was being made with the installation of electric alarm bells at all stations to give automatic warning of a drop in pressure. In the Hull area this work was nearly complete and in other areas it was being carried out as quickly as the supply of materials would allow.

Payment of Deposits

Questioned by Alderman Sir Harry Hardy, Chairman of the Wakefield Committee, regarding a member of the National Federation of Fish Friers, who had been asked to pay a deposit of £50 before gas was supplied to him, Dr. R. S. Edwards, Chairman of the N.E.G.B., said that the system of deposits was a matter of sheer business prudence against bad debts in order to safeguard the Board's revenue and the price of gas to other consumers. The Board's point of view had been fully set out before the Federation, but if it was felt that the Board was being too severe they would be prepared to discuss it further and individual cases could be reviewed on their merit.

After discussion the Consultative Council reaffirmed the previous decision to continue to charge a deposit in certain cases before gas could be supplied, and confirmed two further resolutions:

(1) That the Leeds Local Committee note with satisfaction the Board's scheme of appointing authorized dealers in gas appliances and will be interested to learn in due course whether the service to the public has been widened by the introduction of this scheme.

(2) That in the interests of town planning and the possible creation of smokeless zones the Leeds Local Committee recommends the Consultative Council to ask the N.E.G.B. to take all possible steps to keep down the price of coke and also to follow the practice of the Hard Coke Producers in reducing the price of coke during the summer months.

It was decided to accept nominations from A. G. Bottomley and M. Russell for membership of the Huddersfield-Halifax Local Committee.

Tribute Paid

Sir Harry paid a warm tribute to the retiring chairman of the Consultative Council, Alderman W. Regan, of Halifax, who, he said, had given seven years' excellent and unbroken service.

Alderman H. Sutcliffe, who succeeds to the chairmanship, and others, also paid tributes to Alderman Regan.

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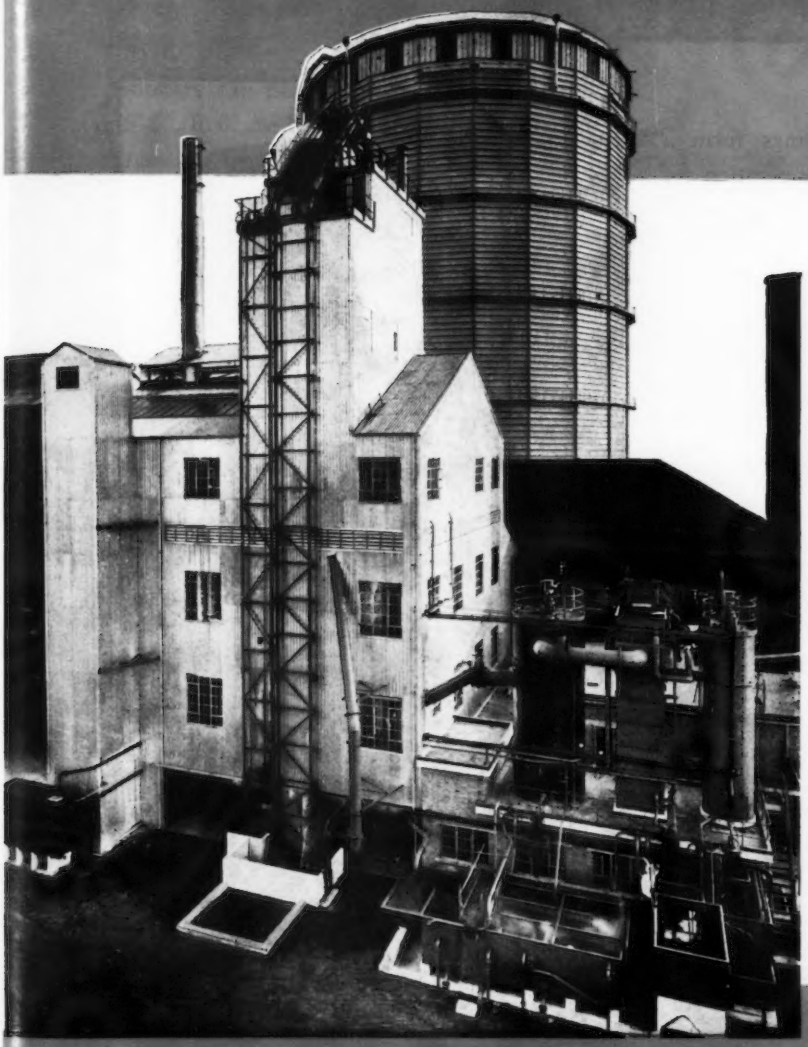

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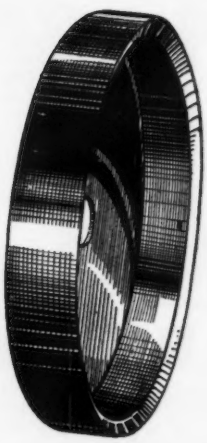

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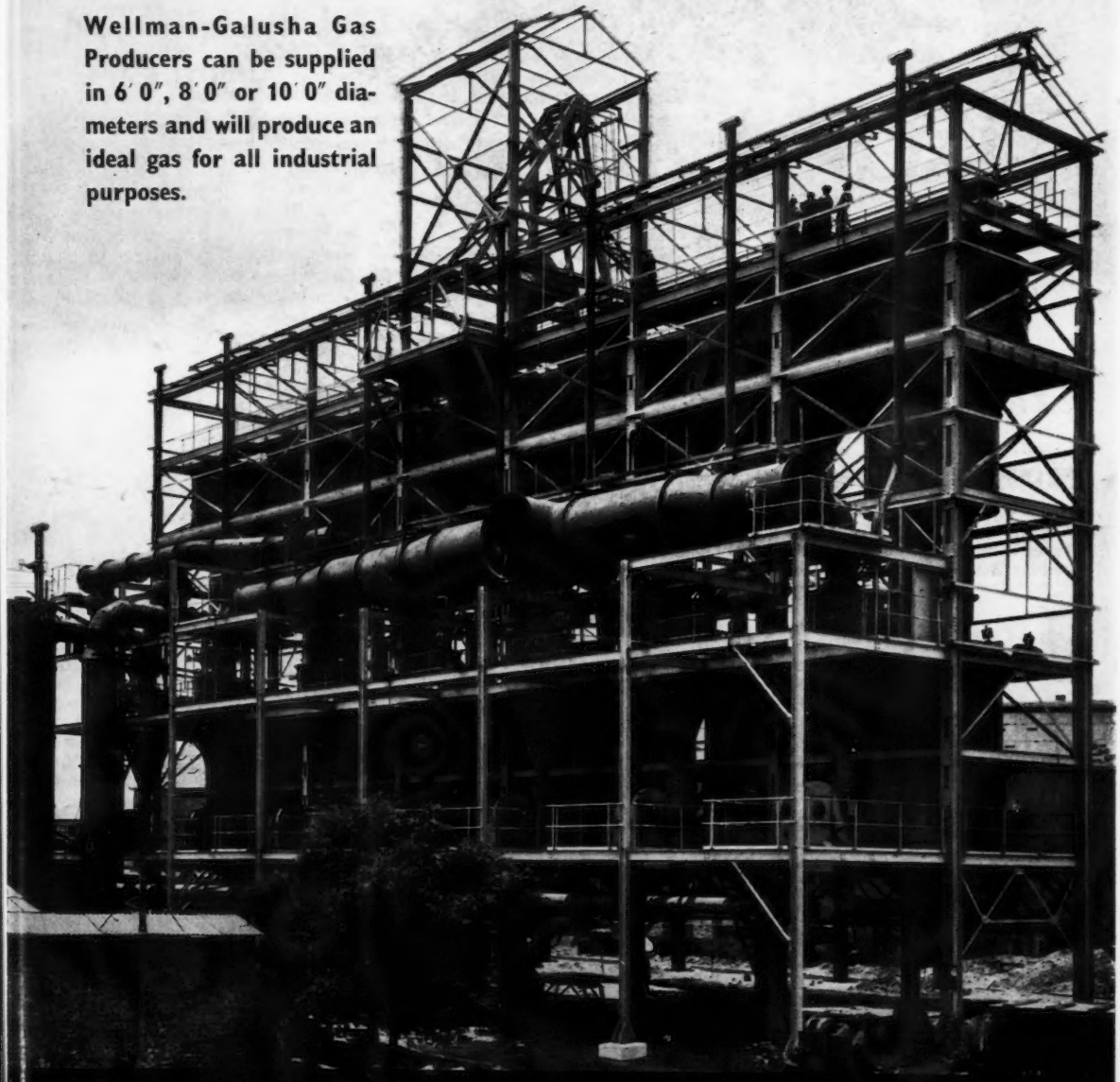
Wellman-Galusha Gas Producers can be supplied in 6′ 0″, 8′ 0″ or 10′ 0″ diameters and will produce an ideal gas for all industrial purposes.



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MORLEY "55" *Wash Boiler*

Boils by gas, so gives your customers just the right temperature for all fabrics Gleaming, glass-hard vitreous enamel, inside and out—detergents cannot harm it. Easy to move. Drains to the last drop.

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Yes—a Gas Boiler with a Wringer! Which means no dripping clothes to haul around. Heats up quickly *and* boils. Holds 10 gallons but takes up little space. Same smart case as the '55', and also has a separate clothes rest. With its elegant lines and fold-away handle, it's a joy for your customers to have around the house.

MORLEY *Washer Unit* FOR THE "55 PLUS"

Slip it through the cover, and your customer has got the lot—a tip-top washing appliance . . . Gas Boiler, Wringer, Agitator ! Takes only *minutes* to swish the dirt right out, and make her washing clean and fresh and bright.

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TEN NATIONS—ONE SALES MESSAGE

Ten countries, member-nations of the International Gas Union, are showing in London some of the methods they use for selling gas. This eight-language exhibition, which runs until June 2 at the Grosvenor Place, S.W.1, headquarters of the Gas Council, was devised by Mr. R. J. Cregg, Publicity Manager of the Gas Council, pictured here at the show.

New Diploma in Technology to be Awarded

THE National Council for Technological Awards, under the Chairmanship of Lord Hives, is to grant a Diploma in Technology, the courses for which will be equivalent in standard to honours degree courses of a British university, it has been announced. The award will be denoted by 'Dip. Tech.(Eng.)' for engineering and by 'Dip. Tech.' for other technologies.

There will be two honours classes, first class and second class, the intention being that a student who successfully completes the course will normally reach the level of second class honours. Those who do not reach this standard may be considered for award of the Diploma at the pass level.

Length of Study

The minimum time required for academic studies in a technical college must not be less than three years' full-time or four years' sandwich. Students attending full-time courses will be expected to have suitable industrial training amounting in aggregate to not less than one year in industry. This must be undertaken either before the course or during it or both. The arrangements must be such as to enable the practical and academic training to be integrated. The sandwich course should include organized studies during the period of practical training in industry.

It is likely that the students attracted to the course (minimum age of admission will normally be 18) will be drawn largely from the best of those who have been successful in National Certificate courses, together with those from the secondary schools who have successfully pursued a sixth form course. The standard of admission will be that of the General Certificate of Education with two appropriate subjects at advanced level and three subjects at ordinary level, or a comparable standard.

Colleges seeking recognition for a course must make formal application to the Council. If the Council decides that there is a prima facie case for recognition the college may be visited in order that the Council may be satisfied that the conditions under which the course is to operate are satisfactory. The college will be expected to provide a substantial programme of advanced studies and to provide good library facilities and social amenities. The staff will be expected to be of high quality and should include persons to whom industry would go for advice.

MORE COKE OVEN GAS FOR SCOTLAND

MORE coke oven gas will be available for the Scottish Gas Board when a £6 mill. development scheme gets under way at the Gartsherrie Ironworks, Coatbridge. The Scottish Gas Board are already large customers for Gartsherrie gas.

The scheme which, when it is completed, will more than double the output of the ironworks, is to begin shortly.

Many outstanding pictures created by brush, pencil, and camera were seen at the annual Imperial House Sketch Club show last month. Above, Mr. H. Robson (right) receives the 'Green' plaque for contact prints from Mr. L. W. Andrew, Manager of Watson House.

Convictions Fail to Keep Down Thefts of Fuel

EDITORIAL COMMENT BY BRADFORD NEWSPAPER

After all the publicity that has been given about thefts in the coal trade and the heavy fines—and sometimes imprisonment—that have been imposed on miscreants who have been caught, it is surprising that offences still occur, the Bradford 'Telegraph and Argus' states in an editorial.

Referring to recent cases in Bradford City Court, the newspaper continues: It was stated that three bags of coal had been delivered to a householder instead of four, that at a school 18 bags of coke had been delivered instead of 22, and that in a third case the price charged for a supply of coal had been too high.

Suspicion Aroused

It was the householder himself who spotted the wrong delivery of coal. He was in the cellar at the time it was put down the chute. But the coke theft from the school was only discovered after the delivery men had aroused the suspicion of a clerk at the office of the Gas Board. Householders have often been advised to count the bags, and now it seems that someone in schools, offices, work places and other institutions should do the same.

It is a task that no one likes to do. If the coal or coke man sees someone supervizing a delivery the implication is that he is not trusted, but the honest deliverers must not be offended. It is the dishonest minority which is to blame.

Gas Industry Cameramen Exhibit Work

Gas Council photographer Arthur Simmons is showing three pictures in the national exhibition of professional photography by members of the Institute of British Photographers at the R.B.A. Galleries, Suffolk Street.

All of Mr. Simmons' pictures are in the industrial class, illustrating various Gas Council activities, including 'The Ivory Oven' at the Bakers' and Confectioners' Exhibition 1955, and the Council's stand at the Engineering and Marine Exhibition 1955.

Stephen Tennant, of Walter King Photos, Ltd., and 'GAS JOURNAL' and 'GAS SERVICE' photographer, is also exhibiting, in colour, at the exhibition which closes on June 8.

An Acute Shortage of Workmen

is the Employer's Main Problem Today

WRITES OUR

LABOUR RELATIONS CORRESPONDENT

BIOLOGY teaches us that constant adaptation to changing circumstances is the law of life for both plants and animals. If an animal or a plant does not adapt itself down the years to radically altered conditions of life and surroundings, it will perish. Employers today face a revolutionary change in the field of recruitment. There is full—indeed, overfull—employment, despite sporadic redundancies. The position may, or may not, change with the advent of new methods of production, such as automation. Automation may so increase production and the volume of exports, that the problem might still be one of labour shortage, despite the fears of employees and of trades unions.

But be that as it may, the main labour problem facing the employer today, about which he is certain, is the acute shortage of employees. And the employer must adapt himself to this fundamental change in the labour market, or find that he cannot man his factory adequately. The employer's attitude to the labour market when it is a seller's market for labour must be radically different from what it was when it was a buyer's market for labour.

Irresponsible Employer

The employer can, of course, and sometimes does, if he refuses or is reluctant to change his attitude, seek to counteract the adverse influences of the labour market by offering higher wages than those generally obtaining in the market. And he may be able to maintain this policy for some time. But it is irresponsible policy to his fellow employers, to the country (it leads to inflation) and towards his customers who have to pay for such enhanced rates in the price they have to pay for the particular firm's products. But unless he can absorb such increased costs, or a substantial proportion of them, by greater efficiency through more up-to-date plant, which means increased capital outlay, with the same or smaller labour force, he may very well price himself out of the market. Unless, of course, he runs a monopoly not subject to normal competitive conditions at home or abroad.

In a restricted labour market it is, of course, the employer, and not the employee, who is on trial. Generally speaking, not only must he 'sell' himself to potential employees in order to secure them, but in order to retain them as well. Human nature being what it is, it is inevitable that the morale of employees is affected by the background of full employment. A research organisation investigating the problem of labour shortage in the U.S.A. had this to report last year: 'The growing labour scarcity apparently had as much effect on workers' morale as it had on wage structures and wage scales. Fourteen of the interviewed firms (out of approximately 80) reported some deterioration in employee morale. It took such forms as increased absenteeism, more lateness, greater independence (even "cockiness"), and an increase in general discontent or grumbling among the work force.'[1] But efficient management can always do something to counteract such deterioration in morale, so that it does not always mean substantial exodus from the employment of companies or firms.

Choosey Employees

The employer must, however, in his own interests face up to the new realities created by a policy of full employment and by the conditions of a welfare state. In such a setting, several alternative jobs are generally open to the majority of workers, so that it is the employee who chooses his employer, and not the employer the employee. Against such a background, the employee is not, generally speaking, faced with the immediate pressure of accepting any job in order to keep his family and himself in food and provided with lodging. Furthermore, employees are now more alert to the possibilities in the employment market, owing to the assistance of the Youth Employment Service, careers masters in schools, publicity consequent upon recruiting drives by employers, and having rubbed shoulders during the period of national service with others from various employments and industries.

Although it is not wise, for the reasons already given, and subject to the same qualifications, for employers to pay exaggerated rates of pay, it is clearly in his interests, from the point of view of recruitment and retention of labour, to pay competitive rates of pay. But the employer will have to look beyond rates of pay alone. For today employees are vitally interested in what the Americans call 'total expectancies'[2]—security of tenure, opportunities for promotion, facilities for training and education, overtime, incentive bonus schemes, sick pay schemes and the like. The social side of employment, since he spends most of his working hours in it, is also of importance to him: The sense of belonging and of being a member of a harmonious, co-operative, and friendly working group. For man does not live by bread alone.

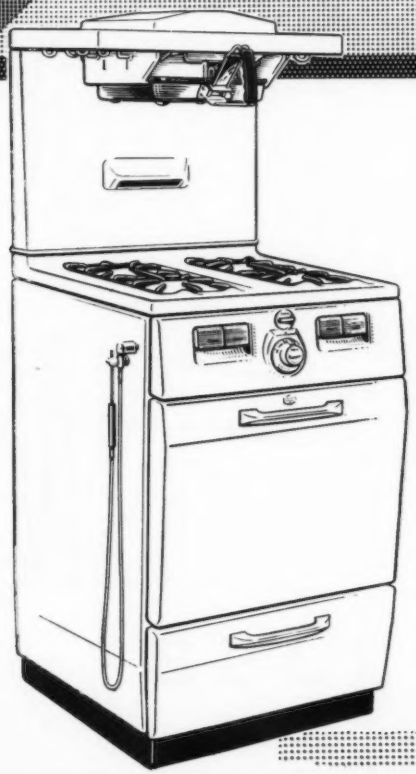
Function of Management

Successful management is, therefore, compelled as never before, to pay close, continuous and specialized attention to recruitment policy, methods of selection, job placing, labour turnover, promotion policies, education and training, accident prevention, the health of employees and their general welfare. And this does not mean pampering the employees. A sick employee with a high record of absenteeism is an inefficient unit of the labour force. An employee untrained and unskilled in his particular job is not as competent as one who is skilled and trained. A disgruntled employee frustrated by lack of promotion possibilities will not pull his weight as thoroughly and enthusiastically as one who sees prospects of promotion for the hard-working, conscientious, competent and loyal employee. A square peg in a square hole will fit more efficiently and satisfactorily into the organization of a business than a round one. And exasperated management constantly faced with high labour turnover will not long be blind, not only to the terrific cost involved, but to the undermining of morale and thus of productive efficiency, consequent upon an ever-changing labour force.

All the more attention will have to be paid to adopting the best in modern management practice because, in a tight labour market, the quality of recruits is, generally speaking, not as high as he would expect in a market where labour is plentiful. He should, therefore, be more than normally concerned with methods of induction, and in inculcating what the Americans call a 'sense of belonging.' If the employer allows the new recruit to wander about aimlessly in his first week, not knowing what his exact duties are, where his exact place of work is, with whom he is expected to work, to whom he is responsible, where the canteen (if any) and other welfare facilities are, the employer cannot expect to keep that recruit long. For statistics show that the greatest labour turnover is in the first few months. And that is the vital period to prove to the new recruit that he is not a foreigner in a strange land, but a welcome addition to the firm's staff. It is also the vital period to make him feel he 'belongs'; that his work is important; that it forms an integral and important part in the creation of the final product; that there is scope for progress, for further training, for continued education. If full advantage is not take of that crucial initial period, management may lose for good manpower of considerable potential value, and have to put up with a continuous stream of 'floaters' and 'drifters,' as the Americans call them.

The Elderly Worker

The enlightened employer will turn his attention to the question of employing the elderly worker. Because of the



For a good cooker

In a daze—of course he is. Evidently the 'keeper knows the right answer—looks certain of the umpire's decision too! Have no uncertainties yourself—collect record scores, say—"It's a PARKINSON RENOWN SIX in fifty six", it *is* the hit of the season.

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★ Eye-level Grill

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This new de luxe model
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It's something new for your
window, to bring the housewife
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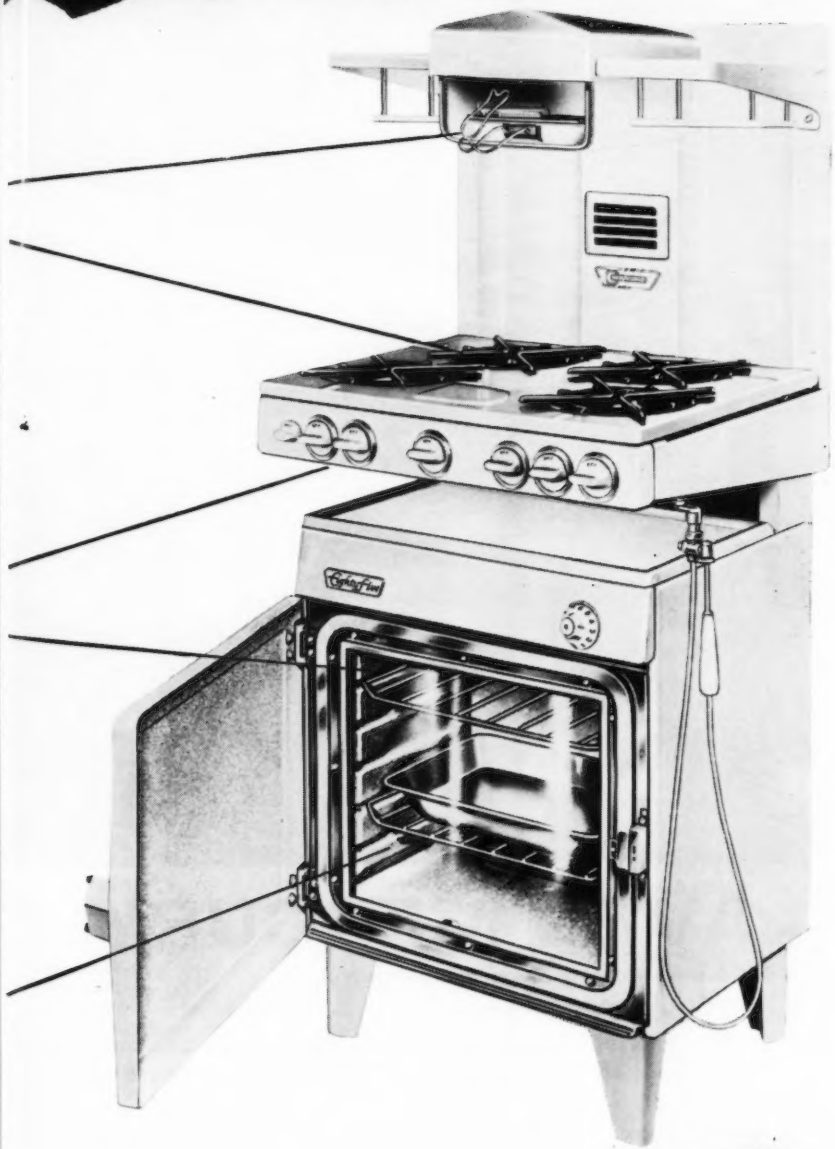

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The full-size, bow-front quality cooker that always makes friends with the housewife

HERE'S a big, well-built, handsome-looking cooker you can recommend with your hand on your heart. The Flavel Mercury gives your limited-purse customers (1) Four new-type fast-boiling burners (2) new enamelled non-spill pan rests (3) an extra-large oven with the new Flavel light-reflecting 'Ice-Blue' finish (4) push-turn safety taps in a choice of ivory, red, blue, burgundy, brown or black—at no extra cost. And show your customers all these other major selling points... Burners of latest die-cast head type: grill has light-across jet ; pan rests enamelled top and bottom for easy cleaning ; Mercury supplied in choice of white, ivory or fawn clean-at-a-wipe vitreous enamel finish (same price).

The Flavel 'National' water heater (shown above) gives half-a-gallon of piping hot water every minute . . . very economically.

★ *Frequent, big-space advertising in the National Press is helping you sell the whole range of big-value Flavel appliances.*

15 Million Housewives will be told 'See a FLAVEL FIRST!'

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changing age structure of the community, the increasing length of life, and because of shortage of labour, the older man and woman provide some of the best manpower available. The proportion of older people in the population is steadily rising, and this change needs to be matched by a similar change in age structure of working population, and for the fullest use to be made of the capabilities of older people. Trial and experiment will show whether some occupations are more suitable for older people or not. They are more adaptable, steadier, and less liable to accidents than is perhaps commonly thought. What they might lack in agility or muscle, they often make up in experience and steadiness and conscientious application to their duties. A high rate of production must always be a matter of the most vital interest to this country, and the productive capacity of older workers must continuously and actively be taken into account. According to the available evidence, writes Sir Frederic Bartlett, 'The implication is that the large majority of a contemporary healthy population can continue efficiently and economically to meet the main demands of industry at least up to the limit of what is still taken to be the normal span of life. . . . Those needs can be met . . . . only if all fit people, from youth to age, play their parts, and only if those parts are planned in accordance with the natural flowering and growth throughout life of human abilities."[2]

And the disabled, too, can often supply the employer with efficient and reliable service. They have already amply proved their worth and their stability. One need think only of the last war. 'It is a significant fact which should never be forgotten,' writes Dame Georgiana Butler, 'that what put the disabled on the map, so to speak, was not primarily the desire to help them, but the country's need of their help. Many thousands of disabled were employed in the munitions industries, and the remarkable extent to which they held down their jobs in that time of crisis, despite long hours of work, the difficulties of transport, the blackout, and so on, has perhaps never been sufficiently appreciated.' And she goes on to say that the employer who engages a disabled person may feel that he is doing him a good turn; but that it is likely to be at least as equally true that he is doing a good turn to himself by getting an efficient workman.

Coloured workers in this country are doing the unskilled, dirtier, and hotter jobs in industry. They are also to be found in work like 'bus conducting and nursing, where it is difficult to recruit staff. But, of course, as has been pointed out, 'great care is essential in the recruitment, induction, and training of coloured workers. Some firms fear the reactions of their other employees, and others are afraid that if they take on one or two, they will be flooded with other applicants. They are also concerned with incidents with girls in their employment and more especially with parents' fears for their daughters.' According to the same author, they usually show great eagerness to work overtime, but are generally slower than the British worker and need more supervision. But their accident and sickness rates are not higher; and the rate of labour turnover among them, even at work where labour turnover is high, is not abnormal.[4]

But difficulties might arise if redundancy should occur, and neither the white employees nor their unions might agree to the operation of the redundancy rule of 'last in, first out,' if it meant displacement of non-coloured employees and coloured workers were retained.

The up-to-date employer will have his contacts with schools, employment exchanges, private employment agencies and last, but not least, with the Youth Employment Service, which can be of inestimable value to the employer if properly used. He will also consider newspaper advertising, although here he must act with considerable circumspection. If he indulges in too much newspaper advertising, he might create the impression abroad that his firm has a high labour turnover, and that all is not well 'in the state of Denmark.'

But the finest and most satisfying source of recruitment is personal recommendation. And that will be forthcoming according to the degree in which an employer adopts the best management practice along the lines already indicated earlier in this article.

(1) *Adjustment to Labour Shortages*, by Richard A. Lester, Industrial Relations Section, Department of Economics and Sociology, Princetown University New Jersey, 1955.

(2) *The Worker in Industry*, Ministry of Labour and National Service, Centenary Lectures 1951, Her Majesty's Stationery Office, 1952, p. 3/6, pp. 86/87.

(3) Ibid, p. 11.

(4) *Journal of the Institute of Personnel Management*, March 1956. Employment of Coloured Workers by Mr. Leslie Stephens.

LONDON JUNIORS: THREE SHORT PAPERS

Maths, Peak Load, Meters

ONE of the most interesting short paper evenings in recent years was held in May by the London and Southern Junior Gas Association under the chairmanship of the President, Mr. N. R. Junkison.

Mr. Junkison is living up to the reputation of London Junior presidents by trying his hardest to produce a session of interesting variety. On this occasion he introduced Mr. E. E. Blandon, a member who has devised some 'Odd Calculations'; Mr. J. D. Grant, Honorary Secretary of the organization, who shared some valuable notes on what he called 'The provision of peak load therms from low boiling point hydrocarbons'; and, finally, Mr. T. B. V. Hirst said some stinging things about the improvement of present-day meter installations after describing the 'one pipe' principle. Owing to the presence of Mr. L. W. Andrew and other Watson House personalities, however, some of Mr. Hirst's barbs were pulled before they fomented.

Mr. Blandon's paper was 'a miscellany of formulas and methods of calculation relevant to fuel technology, developed by the author,' and dealt with the 'Universal flue loss formula,' the 'Average Molecule,' and the 'Igloo method of dividing a spherical surface.' This last calculation is inspired apparently by his criticism of the Russell-angle method which, he says, has a big defect in worsening (for the sake of a trifling arithmetical convenience) the unevenness of distribution of the sampling points, 'which is already a flaw in the equal-angle method.'

About Mr. Grant's paper we propose to say nothing at present; his paper was of a high standard and will be reproduced in part or in full during the summer. Thus the full-scale trials at Fulham during last winter (to provide additional peak load output with the minimum of capital expenditure and labour) might provide useful reference next winter.

Although Mr. Hirst's 'The Heart of the Gas Installation' was not exactly Graham Greene, he certainly had given the matter his earnest attention. In fact, all his arguments have been published in both the 'GAS JOURNAL' and 'GAS SERVICE' and so have the illustrations. His complaint about the gas industry appears to be summed up by the following paragraph from his paper:—

'It is now nearly two years since the first three samples of one-pipe meter and connection were ordered by gas boards. During and since 1954, samples of one-pipe meters and fittings and a great deal of technical information have been supplied, unasked, to gas boards and to the Watson House Centre. Since January, 1955, the originators of the one-pipe principle have been asking for an expression of the wishes of the gas industry. So far, nothing has emerged in writing to indicate whether the ideas are thought to be good or bad. No one has dared to say: "Let us try this thing out." Meanwhile, the one-pipe meter and connection have been accepted in eight other countries: Canada, Denmark, Holland, Germany, Italy, Sweden, Switzerland, and Turkey.'

Mr. D. R. Wills, who took part in the discussion afterwards, said in reply to Mr. Hirst: 'There is bound to be some slowing up of ideas these days. Production costs are so high that manufacturers tend to ask us to ensure some idea of the market.'

Presented at the 93rd Annual General Meeting of the Institution of Gas Engineers, London, May 29, 1956.

The President's Address

By W. K. HUTCHISON, C.B.E., B.A., B.Sc., M.Inst.Gas E., M.I.Mech.E.,

Chairman, South Eastern Gas Board.

THE 93rd annual general meeting is made memorable by the honour that His Royal Highness The Duke of Edinburgh has conferred on The Institution of Gas Engineers by consenting to attend and to receive his scroll of Honorary Life Membership. This notable event will give great pleasure to those who are able to be present today and is an inspiration to all our members. We see in it a mark of confidence in the future of our Institution and the profession of gas engineering which it exists to serve.

In 1952 Her Majesty The Queen graciously conferred her patronage on the Institution, and at the autumn meeting in the same year the Duke of Edinburgh accepted election to Honorary Life Membership. That was the year of Mr. Currier's Presidency, and so it is appropriate that he has signed the scroll in his new capacity of Honorary Secretary.

I have to record with sincere regret the death, soon after his 90th birthday, of Dr. A. G. Glasgow, one of our honorary members, a gifted American and a good friend of this country. It is given to few to be identified so closely with a fundamental development in any industry on such a far-reaching scale and over so long a period as he was, for it was nearly 60 years ago that the first water gas plants of his design were installed in London and Liverpool. We have learned with pleasure and pride of the terms of a bequest in Dr. Glasgow's Will whereby he bequeathed a sum of money to the Institution 'in deep appreciation of its high qualities.'

The past year has been one of continued progress. The finances of the Institution are in a sound state, but the persistent increase in costs of all kinds is already giving rise to concern. I must refer particularly to the cost of printing and publication which constitute such an important part in our activities, and couple with that reference an appeal to authors for economy in the use of words and diagrams. It may even be found that the discipline imposed by conscious restraint of this kind serves to reveal more clearly than otherwise the meaning that it is sought to convey. The pattern is set by that Prime Minister who began a message with the words: 'Let a report be prepared on two sheets only. . . .'

The standing committees have continued their invaluable work, and I wish to pay tribute to their members and especially those who carry heavy responsibility as chairmen for their untiring efforts.

The Education Committee has co-operated with the Gas Council in the discharge of the Council's statutory responsibility for education. Government policy as announced in the White Paper on technical education will give greater opportunity than ever before for young men to enter universities and technical colleges, but the demand for the finished product is likely to outstrip the supply for many years ahead.

The industry can play its part towards meeting the national shortage of trained engineers and technologists by encouragement of those willing to qualify by part-time study. Sandwich courses, whereby a student spends six months gaining practical experience on the works and six months at a technical college each year, have now been established in several centres and have received the approval of the Committee as a course of training for the Associate Membership Examination.

The gas engineer has no responsibility more serious than for the safety of the men he employs, and it is in this field that the Gas Works Safety Rules Committee has carried out valuable work over the years. The setting of adequate standards, the careful analysis of causes of accidents, and the dissemination of information have contributed to the avoidance of hazards in the ever more complicated and mechanical processes of gas manufacture.

The Pipes Committee has been very active, as is fitting in a period when the industry is passing through a phase of integration more widespread than ever before in its history.

These and other committees of the Institution continue to render a service to the industry which should not be measured solely in terms of the reports issued. They provide also a valuable forum for the exchange of information and full and frank discussion, between engineers and specialists working in the supply side of the gas industry and those who come from the plant and appliance manufacturers.

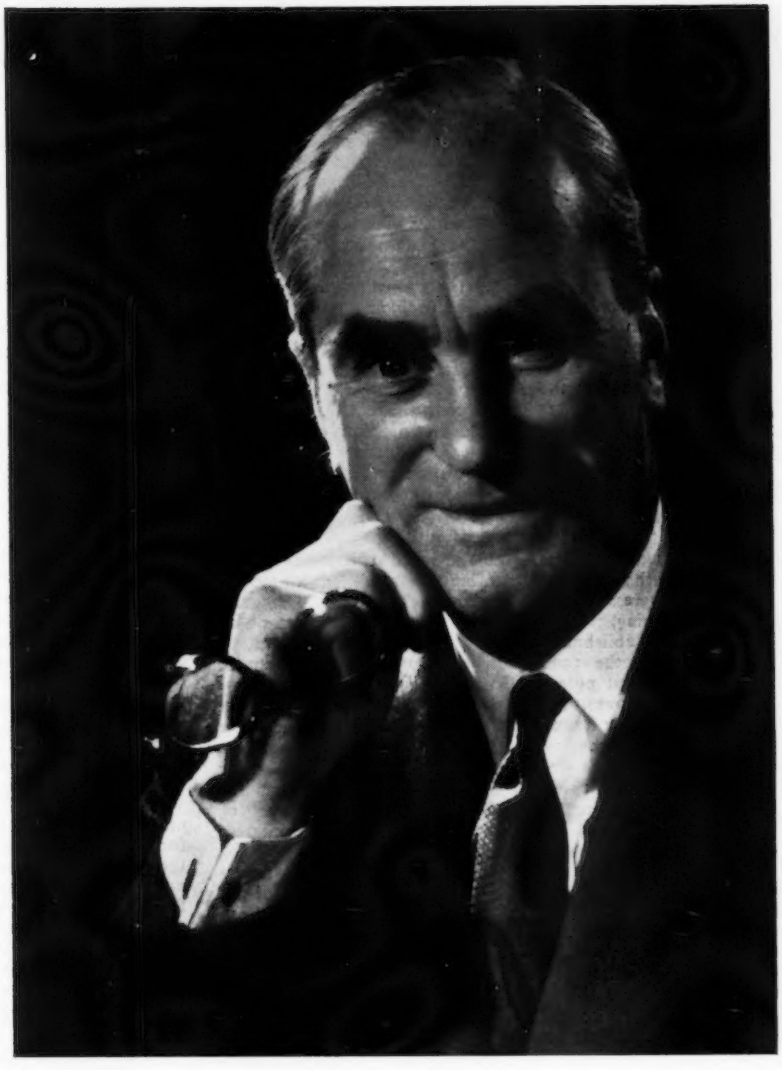
The International Gas Union

The Institution was a founder member of the International Gas Union, and great benefit has been derived from participation in the triennial conferences where experts from many nations can meet and exchange views on the production and utilization of gas. The meeting held in the autumn of last year was well attended, and 39 members of the Institution made the journey to New York. We had sponsored two reports, and in addition three papers were presented by our members, who also took a leading part in the conference and discussions.

If at times it seemed that on the international plane there was a lack of interest in the problems that concern us most, it must be remembered that the gas industry in Britain is more deeply committed than that of any other nation to the carbonization of coal in its own works as the means of gas production. The gasworks of Great Britain carbonized in 1953 (the last year for which I.G.U. statistics are available) a total of 28 mill. tons of coal. The other 17 nations listed, comprising most of the world outside the Iron Curtain, together carbonized in their gasworks just over 25 mill. tons, and one area gas board alone carbonized in that year more coal than the whole of the gas industry of France and nearly as much as that of Western Germany.

The International Gas Statistics show also how, of all the countries listed, Great Britain leads in the degree to which a gas service is available generally to the community, and, with the exception of the United States and Canada, in the amount of gas consumed per head of population. This high degree of saturation in Great Britain compared with other highly industrialized countries of Western Europe has to be taken into account when comparing our progress and future plans with theirs.

A feature common to all the countries cited is the substantial increase in consumption between the years 1938 and 1953, amounting generally to 60% or more. A stricter comparison, however, would have to take into account also a great increase in distribution of liquefied petroleum gases in countries not fully served as we are with piped gas.



MR. W. K. HUTCHISON.
Photograph by Douglas Glass.

In visits arranged before and after the main business sessions, we saw for ourselves the vitality and progress of the American gas industry, which has expanded by 285% between 1938 and 1953 and now supplies one quarter in heat value of all the mineral fuels and water power consumed in the U.S.A. The quantities of gas sold, the distance over which it is transmitted, and the rate of development of the business were a revelation to the visitors from Britain, even though the report of the gas industry's productivity team in 1952 had prepared them for what they now saw.

An abundant supply of natural gas is, of course, the usual explanation, but to some it appeared that the American single-minded approach to gas as the perfect fuel contributed greatly to the remarkable prosperity of their industry.

Coke and Clean Air Bill

Here in Great Britain social and economic changes resulting from the second world war have brought about a more or less continuous state of fuel crisis. In spite of the highest standard of wages in its history, coal mining has ceased to attract recruits and has difficulty in maintaining its labour force. Output of coal remains at about 220 mill. tons per annum, and there is a gap between our total fuel needs and our home production equivalent to about 20 mill. tons of coal. The gap tends to widen as the policy of full employment with an increasing standard of living lead to extra demands for comfort in the home, which can only be achieved by the consumption of extra fuel in the home, or, indirectly, in the form of goods and services.

The fact-finding Egerton Committee and its successor, the Simon Committee, pointed out one cause of this situation and the remedy. The British way of life based on a century of abundant coal had left us with the most inefficient methods used in the cilivized world for providing and retaining heat in the home. New and improved appliances using suitable fuel with a higher efficiency than the open coal fire would alone go far towards bridging the gap. The claims of gas and coke were established, but little was achieved against an unrelenting prejudice in favour of the coal fire and a pricing policy that favoured domestic coal at the expense of the raw materials of the gas industry. Open fires of improved design based on the pioneer work of our coke laboratories were installed in large numbers, frequently without gas ignition. Moreover, with the help of controlled draught and better design, many people were able to keep them alight all night on inferior coal and so to produce a hitherto unparalleled ratio of smoke to heat.

What good sense and logic could not achieve was reached

almost overnight when, in December, 1952, after six days of thick fog the death roll from pulmonary diseases in large cities rose alarmingly. The public demanded a culprit and, after yet another Committee had sat and reported, they found that they themselves had been proved guilty. The Beaver Committee Report foresaw the establishment by stages of a smokeless Britain and once again the importance of gas and coke in the fuel future of the country became clear, for it would be necessary to substitute coke for coal in the open fire if anything were to be achieved in reasonable time.

Now it was the general public, not economists and scientists, who had decided; through democratic processes they were able to give effect to their intentions, and the Clean Air Bill is the result. When this passes on to the Statute Book, powers of compulsion will take over where common sense has failed.

In preparation for this situation, the Institution has given much time and consideration to the problem involved in the supply of adequate quantities of coke suitable for domestic use. An important and comprehensive symposium was held during the 21st Autumn Research Meeting and has been followed by discussions in many of the district sections. We do not underestimate the difficulty of switching demand from one market to another, and of producing a coke of the right quality from the widely varying types of coal that the industry is required to use, but we are confident that these problems can and will be solved.

The Gas Industry in Britain Today

However, we live by gas, and the rapid expansion of sales that followed the war is now slowing up so that it is a time for reviewing progress and planning a new advance. The great task of replanning, reorganizing, and physical integration which followed the establishment of the area boards is on the way to completion and the country is well served by a system of supply with a vast potential for development.

Looking back over the way we have come, we see an industry that has always been prepared to adapt itself to each new circumstance and ready to meet any challenge. When the Welsbach mantle was no longer able to compete for lighting against electricity, cooking by gas took over the load that was lost, and water heating, house heating, and a great variety of industrial applications serve to maintain a steady progress against increasingly severe competition.

For the purpose of assessing this competition, it is necessary to assume certain practical equivalents to a therm of gas in terms of electricity and coal. In Table 1 it has been assumed that 1 therm of gas is equal to 20 units of electricity and that 5 therms are equivalent to 1 cwt. of coal when the several fuels are used for domestic heat services. The prices shown for gas are the normal flat-rate prices, but for some years prior to the second world war gas was obtainable in London and other parts of the country on 'half-price' tariff terms, which gave the much more favourable competitive position shown in the bottom line of the table.

TABLE 1.—*Comparable Cost of Heat Services.*

Year	Price in Pence of				
	Gas 1 therm	Gas 5 therms	Coal 1 cwt.	Gas ½ therm	Electricity 1 kWh*
1	2	3	4	5	6
1910 to 1914 ..	5	25	15	0.25	1.25
1919	11	55	42	0.55	1.25
1927 to 1938 ..	9	45	30	0.45	0.50
1954	20	100	78	1.00	1.00
1938 Tariff* ..	4.5	22.5	30	0.23	0.50

* Commodity rate in a two-part tariff.

It is difficult to-day to offer anything like such favourable terms as those of the pre-war tariff because of the disproportionate increase in the cost of coal to gasworks compared with the cost of coal to the householder. The domestic user of coal today is paying three times what he did in 1938, but the gasworks are paying about five times the pre-war figure, and the cost of producing gas represents a much higher proportion of the selling price than ever before.

From where we stand, then, it is possible to see three ways ahead. There are many who feel that the middle road is the one to follow, continuing by well-established means to maintain a business that neither grows nor shrinks. Taking into account the exceptionally high degree of development of gas sales in this country and with so few consumers remaining to be connected, those who take this view can see no wide scope for increase in a worsened competitive position.

There may be some who feel that the downward road is the only possible one in face of nuclear energy, petroleum imports, and the ever rising price of coal—but I trust that this view will remain the special prerogative of our competitors, for it is unworthy of the history of our industry.

The third way is to accept the challenge of the present time in which an expanding economy demands ample fuel services that shall be clean and automatic. Nuclear energy, hydro-electricity, and natural gas if it is found and so long as it remains available, can provide such a service, but I do not think this country can ever afford to forego the natural resources that it has in the form of coal. This coal, if converted into gas, could provide a large part of the clean, convenient, and economical service that a rising standard of living demands.

Our industry is based on coal, and fairly constantly over the past 10 years 85% of all the therms sold have been produced from coal and only 8% from coke and 7% from oil. As I have remarked earlier, there is a gap between the nation's fuel needs and its total fuel production from all home sources equivalent to about 20 mill. tons of coal a year. This has been met in part by purchasing coal from other countries, and some of this is quite good in quality though different from the qualities to which we are accustomed and for which our processes are designed. But it is expensive coal, requiring foreign currency, and still has all the disadvantages of being coal.

Oil is a more attractive material to use, both to the fuel consumer and to those like ourselves who wish to convert the raw material into gas. It has the merit that a large part of the price paid for it returns to this country, and so we may expect for some time at least that an increasing proportion of the therms delivered as gas will be produced from oil, and preferably from such of the various products of oil distillation as may be surplus at any one time.

In the long term, however, it may be necessary to look to coal again to provide for the continued expansion of gas supplies which we believe the future will demand. If the conversion of this coal can be achieved with the efficiency that modern techniques make possible, the way should be clear, for example, as and when any part of the 30 mill. tons of coal that now go to the power stations is released, through the application of nuclear energy, and gasified, that gas when used for appropriate purposes would give as much service as twice that quantity of coal burnt in boilers at the power stations. It seems wrong, therefore, to regard nuclear energy and oil as making the wise use of coal unnecessary, but they can so relax the insistent pressure on coal availability that new and better ways of using and converting coal can be adopted.

The Carbonization of Coal

Whatever the future may hold, the present state of the industry has been reached through, and is even now based on, coal and on one method of conversion of coal into gas, that of carbonization.

This is a process of which we are proud, and successive generations of gas engineers have built it up to a high rate of efficiency. One measure of that efficiency is the yield of gas per ton of coal, or, more exactly, the hydrocarbon enrichment value (H.E.V.). Up to about 1930, coal gas yields generally tended to increase and from Durham coal, with the quality then obtainable, 75 or 76 therms per ton of straight coal gas at an H.E.V. of 38 was a good standard of working. Beyond this we have not advanced. Indeed, deterioration in coal has made the former figures no longer attainable and we know enough about the chemistry of carbonization and tar cracking to realize that in this direction no substantial progress is likely.

Another criterion is the overall thermal efficiency of the process. Two modern types of carbonizing plant, the coke oven and the continuous vertical retort, carry through the operation of carbonization with the expenditure of little more than 10% of the heat in the original coal. The continuous verticals do, and coke ovens can, if the coke is dry-cooled, provide all the steam needed both for process and for power production. It would be asking too much to expect any substantial increase on this very high figure of nearly 90% efficiency.

A third criterion is that of cost. Process wages were at one time a large proportion of the total cost, but on modern plant

the process labour demands have been cut to the point where little further reduction can be hoped for. This has not been done without expense. A newly commissioned vertical retort plant has cost five times as much per therm of output as one built before the war. For reasons such as these, we may not go further in the direction of reducing labour by making carbonizing plant more complex.

There is one direction in which further technical progress may be possible, and that is to increase the throughput of this costly plant. An obvious way is to use it for the purpose for which it was built, namely, the carbonization of coal, and not for the production of water gas, which can be made separately and efficiently elsewhere. We have seen also in recent years an interesting attempt to increase the speed of carbonization in continuous vertical retorts still further by adopting the carrier gas technique to increase the rate of heat transfer.

With so much achieved and with so little scope for further technical advance, it might be concluded that carbonization as practised to-day is the perfect process, if in fact the sole aim is the conversion of coal into a variety of products. But in this feature, on which we have tended to pride ourselves, there lies a source of weakness, for these other products—and here, I refer particularly to coke—are very large in quantity compared with the gas produced. Consequently, the cost of gas production is profoundly influenced by the price obtainable for the coke while at the same time the inflexibility of the ratio in which gas and coke are normally produced makes it difficult, if not impossible, to have any effective control of the marketing situation. So long as these conditions persist, it is more realistic to classify coke as a residual or a by-product than by wishful thinking to define ours as a two-fuel industry.

Figure 1 depicts the variations of the net materials element in the cost of coal gas, as the coke/coal price ratio (usually

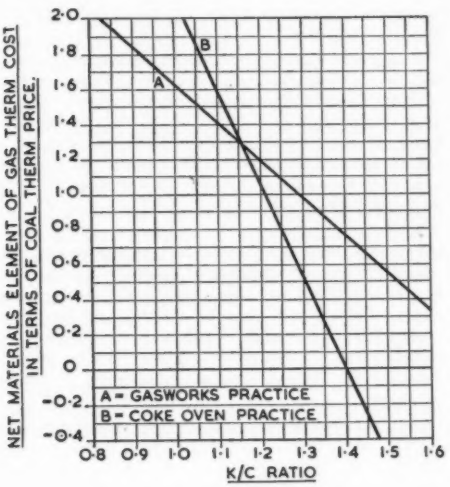


Figure 1.

defined as the K/C ratio) varies. Line A represents normal gas practice where the carbonizing plant is heated by producer gas made from coke. Line B shows the position in coke oven practice where operation is for the maximum yield of coke and gas is used for heating.

In general, we see that the better the K/C ratio the lower will be the net materials element of gas cost, and the effect is more noticeable in coke oven practice than under the conditions of the gas industry.

At a high K/C ratio—1.4 and above—gas is so cheap and coke so dear that heating will normally be by gas. At intermediate values, in the region of 1.2, there is little to choose between gas and coke, and the choice of heating medium may be determined by other factors, including the markets available for the two fuels.

The British gas industry has had to be content for the most part with a K/C ratio no better than 1.0, and the relative costs of gas and coke leave no choice as to the fuel to be used for heating the carbonizing plant. From time to time, the ratio has even fallen below unity and a partial remedy for this situation is to relieve the coke market of some of the surplus supply by making water gas, and so long as the coke remains cheap, in comparison with coal, water gas will also be cheap. The difficulty is that as the K/C ratio improves, and makes possible a lower net materials cost of coal gas, this reduction is offset by the rise in the cost of water gas which is now being made from expensive coke. While the two processes are being used together in an attempt to balance the supply of coke against the demand for it, they do make it impossible to obtain the full reduction in costs that would spring from an improvement in the K/C ratio.

It may well be asked how processes with these disadvantages were operated over many years economically and competitively. The answer is that coal could formerly be bought at a price commensurate with its value as a raw material for gas manufacture and not on some other valuation. The coal price structure makes it clear that those days are unlikely to return.

So it is essential to master this coal/coke/gas price situation. Under exceptional conditions—that is, if the demand for coke in relation to gas exceeds that naturally resulting from the carbonization process as practised in gasworks, and the price obtainable is equivalent to a K/C ratio of 1.2 or over—it might be possible to rely on the carbonization process alone, using the alternatives of gas and coke for heating the retorts so as to control the products released to the markets. A more probable solution lies in the production of gas at a competitive price by other means. Complete gasification processes with thermal efficiencies of 70% offer the possibility of net material costs comparable with those of coal gas and plant investment costs that are somewhat lower and widen the field of selection of coal. Another way lies in the extended use of oil. This may take the form of oil-gasification plant included as part of the normal gasworks equipment, or the more specialized works operated in connection with a refinery to receive such products as may from time to time be available. Natural gas, if it can be found or imported, is yet another means to this end.

By one or other of these methods, or a combination of them, it should be possible to control the output of coke at a level commensurate with the demand for it as a refined fuel and so limit the cost of gas production as to maintain the competitive position and prepare the way for a further advance.

The American Industry

When considering the direction in which an advance may be possible, it is natural to turn to the American gas industry. Of course, in America they have natural gas on tap and natural gas is cheap, but they have their own problems. A great part of the populous region of the U.S.A. is a long way from the gas wells and American utilities have had to overcome many difficulties before their transmission systems and storage grounds could deal with all the problems of peak load to which an expanding business committed them.

Gas is cheap in America, but it is often cheap only to those who use enough. One large east coast undertaking, for example, charges the equivalent of 83d. for the first therm per month, 22d. per therm for the next 9 therms per month, and 12.25d. per therm thereafter. A domestic consumer using the 100 therms or so per annum which is customary in Great Britain would be paying more per therm than he would do in most parts of this country. But, on the house heating contracts, he could obtain gas in excess of 50 therms per month for about 10½d. per therm, and, with such attractive prices for domestic heating, it is not surprising that the annual consumption per consumer is nearly 1,000 therms.

The problem we have to face is whether, without the advantages of natural gas supplies and without the vast storage facilities that become possible by refilling exhausted gas wells, we can, by making use of the flexibility of our processes—actual and potential—together with the presence of our mains beneath the roads, where the flow of gas is not impeded by conditions of ice and snow, put ourselves in a better position than competitors to meet all the requirements of a whole-house service including, of course, the peak demands. It is true that solid fuel can be stored on consumers' premises, but the peak heating demand is not, in fact, met by fuel so stored, as each cold spell reminds us. The real peak heating demand has then to be met by gas, electricity, and paraffin, which are left with only that part of the heating load that no one really desires to have—the extreme peak of the severe cold spell. Nor can be avoid having this unwelcome load, because what-

ever we do we cannot control the situation. A recent survey of experience during a peak period showed that 25% of the households visited had used the gas oven to keep the house from freezing. It is interesting to see what the problem looks like under the conditions of the American gas industry.

In Figure 2 is a curve relating atmospheric temperature and gas output for the Public Service Electric and Gas Company of New Jersey. This undertaking reckons to meet the peak heating demand when the outdoor temperature is 0°F. Over the temperature range 90° to 65°F., the curve rises much more steeply than is represented by a linear relationship with

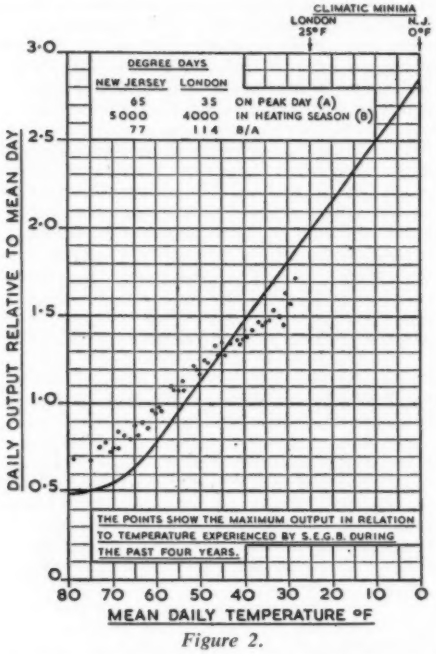


Figure 2.

temperature, but from then on down to 0°F. the relationship is linear. This, of course, is to be expected of space heating installations designed to take the full heating load; such installations should indeed represent for the gas supply industry a liability limited by the maximum fuel consuming capacity. In Table 2, I have tabulated the recorded experience of this particular American utility over the five years 1950 to 1954.

TABLE 2.—**Relationship of Peak Load to Mean Load of Gas Supply in New Jersey.*

	1950	1951	1952	1953	1954
Heating load as percentage of total load..	23	27	30	31	35
Planned peak day (0°F.) relative to mean day	2.11	2.17	2.72	2.90	2.90
Actual minimum daily temperature ..	14°F.	15°F.	27°F.	6°F.	9°F.
Actual peak output relative to mean day ..	1.81	1.83	1.65	2.32	2.48

* From information supplied by the Public Service Electric and Gas Company, New Jersey.

In 1952, with an outside temperature of 27°F., the peak day was equal to 1.65 times the mean day, a figure that is very close to the recent experience of the South Eastern Gas Board. This method of expressing the peak daily demand in terms of the mean day's output is convenient both for planning the installation and the operating programme of plant, and for assessing the earning power of a plant in relation to its capital cost. The alternative system of comparing summer and winter outputs is also important, but can be unduly disconcerting if taken alone. In Great Britain, we are accustomed to a winter/summer ratio of about 2.5:1. At the lowest temperature that we are likely to meet, the gas undertaking of New Jersey now provides for a winter/summer ratio of 4.4:1. Even this need cause no undue concern; for, as I have said earlier, if the amount of carbonizing plant is limited to that required to produce the coke that the coke market demands and will pay a proper price for, coal gas firing during the summer months becomes possible and reduces the base-load plant capacity to half. Alternatively, methods of gas production from oil offer possibilities of much reduced capital costs. At the extreme of the cold winter day the American solution of peak shaving by means of liquefied petroleum gases could be used here also with advantage.

The Next Step

It is not my purpose to try to reach any final conclusion as to the future course that the gas industry should pursue in seeking to maintain and expand its markets, but it is permissible to suggest that with a full knowledge of the techniques available to us, and with the experience of others to guide us, a modest advance into the production of whole-house service by means of gas could be undertaken without undue risk.

Consider a normal pattern of 100,000 consumers made up of 94,000 domestic consumers averaging 124 therms per year, and 6,000 industrial consumers averaging 1,667 therms per year, or an average of 216 therms per consumer.

If, by an intensive effort, it were possible to convert 10% of the domestic consumers to a whole-house service averaging 1,000 therms per annum, the new pattern would be made up of 94,000 domestic consumers averaging 216 therms per year and 6,000 industrial consumers averaging 1,667 therms per year, making an average of 304 therms per consumer, or an increase of 40% in the annual sales.

The works supplying these 100,000 consumers might have contained originally carbonizing plant of a daily capacity of 50,000 therms, together with water gas plant equivalent to a further 50,000 therms, to meet its peak load of 97,000 therms per day. It woud be necessary, after obtaining the extra business, to provide for a peak day of 160,000 therms, which will be equivalent to 1.93 times the mean day and just three times the summer day.

The storage of liquefied petroleum gases equivalent to one maximum day's output would make it possible to shave the peak by 20% for five days or 10% for 10 days. There would then be required additional plant of 40,000 therms per day to meet the daily demands in excess of 100,000 therms, and oil gasification might be chosen for this purpose on account of the low capital cost, although, under favourable circumstances, some additional carbonizing plant, gas-fired in summer, might be preferred.

Probably, there would be some addition needed to the distribution system. Escreet, in a paper presented to the Institution in 1948, showed that, at about 1,200 therms per consumer per annum, distribution cost per therm need be only about one third of that at 120 therms per annum. From his figures, it is estimated that the necessary addition to the mains system might cost about £30 per consumer adopting a whole-house service by gas.

The total investment needed to meet the new demand is then:—

	£
Additional plant (40,000 therms oil gasification at £12 5s. per therm)	500,000
L.P. gas storage (160,000 therms *or* 140,000 gal.)	50,000
Addition to mains (£30 per consumer adopting a full service)	300,000
	850,000

This is equivalent to rather less than £100 per consumer converted, surely a modest speculation for a sizable reward.

A full consideration of the economics of the new situation would require more time than I have available today, but it would be reasonable to assume that the additional gas will not cost more than 8.25d. per therm for net materials and operating costs, and that capital costs described represent less than 3d. per therm; so that it should be possible to offer tariff terms that are attractive and competitive with other fuels.

In this connection, I would stress the importance of not segregating that part of the load which is represented by house heating. The domestic load should be considered as a

(*Concluded on p. 611*)

WALES AND MON. SECTION DISCUSS SYMPOSIUM

Contributions from W. R. Branson and W. Hodkinson

ONCE again the Symposium on Coke has been discussed—this time by the Wales and Monmouthshire Section of the Institution of Gas Engineers at their Spring meeting, Llandudno. Mr. W. R. Branson, Deputy Chairman of the West Midlands Gas Board and joint author of one of the papers of the Symposium, and Mr. W. Hodkinson, Chief Technical Officer of the North Western Gas Board, the author of another of the papers, were invited to address the meeting.

MR. BRANSON'S CONTRIBUTION

Mr. Branson said:

The consumption of coal by domestic consumers was estimated by the Beaver Committee as 36.8 mill. tons per annum. Of this amount, 19 mill. tons are bituminous coal used in the 'black' areas which should be replaced by gas, electricity and solid smokeless fuel. In appendix XI of their report the conclusion is reached that 10 mill. tons of additional coal will need to be carbonized to produce coke for domestic use in the black areas.

Of a total of about 37.5 mill. tons per annum of smokeless fuel produced, only about 6 mill. tons is used domestically, the balance being largely used in blast furnaces and other industrial processes. The gas industry supplies, in the form of coke, rather less than half of this domestic smokeless fuel out of its gross production of about 16.5 mill. tons, including that used in producers, water gas plants and for other works purposes. This internal consumption totals nearly 6 mill. tons.

The Gas Council in its evidence before the Beaver Committee stated that it foresaw the possibility of transferring 4.6 mill. tons of gas coke from other users to the domestic market in the black areas. Such a transfer is not a simple operation and will require time. Time is needed for the installation of new equipment in the factory to release coke which may then not all be of a size suitable for domestic use and may require cutting. Further, the load factor of the domestic user is not so good as that of industry and a transfer, therefore, calls for increased storage facilities at gasworks and delivery in smaller quantities. These necessarily increase the cost of supply.

The panel examined the possibility of the substitution of other fuels for coke now used at gasworks. The present consumption is approximately as follows:—

In producers for heating retorts	4	mill. tons per annum.
In water gas plants	1.5	" " " "
For steam raising	0.3	" " " "
Total	5.8	" " " "

The small quantity used for steam raising is declining annually and the panel concluded that no special steps were necessary to accelerate this decline.

The replacement of coke in producers by coal was concluded to be uneconomic because of the high capital cost of external mechanical producers designed to use bituminous coal. The heating of retort settings by oil is being investigated. The use of dry steam coal, itself a smokeless fuel, in water gas generators appears to be of little advantage from the point of view of smoke abatement. The gasification of high volatile coals by such processes as the Gaz Integrale or Tully may prove to be one means of reducing demands for large coke. Oil gasification by the Onia-Gegi or Segas processes may also help but as with the gasification of high volatile coals progress is limited by the rate of installation of new plant.

The panel conducted a survey based on questionnaires completed by all area boards so as to ascertain the extent to which existing plant was capable of being used to produce more coke. The survey showed that, due to inadequate supplies of coal, boards were producing less coal gas and correspondingly more water gas than would have been the case had coal supplies been unrestricted. It was also estimated that some 380,000 tons of coke per annum could be produced by the operation of carbonizing plant at a higher load factor and using any surplus gas for the heating of retorts. The raising of the calorific value of all gas made in continuous vertical retorts to 500 B.Th.U. per cu. ft. was calculated to result in an increase in coke production of about 1 mill. tons per annum.

Summarizing, the additional coal required and coke produced, possible with existing plant was estimated to be as follows:—

	Additional coal required mill. tons per annum	Additional coke made mill. tons per annum
(*a*) Supplies of coal increased so that manufacture of coal gas is increased and production of C.W. gas reduced	1.54	1.14
(*b*) Carbonizing plant operated at 83% load factor, surplus gas being used for retort heating	0.54	0.38
(*c*) Coke used for steam raising and sundry purposes replaced by breeze and waste heat steam	—	0.35
(*d*) Calorific value of gas raised to 500 B.Th.U. per cu. ft.	1.0	1.0

Thus, with existing plant, it should be possible to carbonize about 3 mill. tons more coal annually and to produce over 2½ mill. tons of additional coke for sale.

Any further increase in demand for coke will involve the construction of new plant. The average increase in coal carbonization forecast in 'Fuel for the Nation' was 250,000 tons per annum. After allowing for substitution in industry and for the additional coke production possible in existing plant it is clear that the rate of construction of new plant will need to be accelerated if the development of smoke controlled areas is to proceed at a reasonable pace.

It is not anticipated that shortage of carbonization coals as such will prove a major difficulty in the way of increased production although this may be an important factor in certain localities. Not much more than half of the production of coals in the 301 to 600 range is carbonized, though some of the remainder may be too high in ash and sulphur.

However, since the demand for increased production of metallurgical coke may lead to coke ovens utilizing increasing quantities of gas coals for blending purposes and because the house coal released by the creation of smokeless zones will largely be of low rank (800 and 900) in the Midlands, the work described in the paper by Mr. Pickering and the speaker was initiated in Birmingham. This showed that, while mixtures of caking and low rank coals were not very satisfactory in continuous vertical retorts, the carbonization of low rank coals alone was practicable and did not involve loss in output though yields of both gas and coke per ton of coal were low. The economics depend upon the location of the gasworks in relation to the coalfields. Where freight on normal gas coals and low rank coals are equal, however, the use of low rank coal was estimated to result in coke production costs of some 30s. per ton more than from normal gas coals.

The coke produced from these low rank coals is highly reactive and has a flexibility in the open fire much superior to that of normal gas cokes from continuous vertical retorts. The paper by Dr. Eaton and Dr. Burden deals with the question of coke quality and appliance performance.

The first part of this paper reports the results of analyses of consumer complaints arising from coke deliveries from works of the North Thames Gas Board. The major cause of complaints is shown to arise from the presence of breeze and in-

accurate grading even where control samples taken at the works indicated a reasonably high standard of grading. Segregation in the hoppers is thought to be the principal cause of the trouble.

MR. HODKINSON'S CONTRIBUTION

Mr. Hodkinson said:

Dr. Burns in his paper deals with the various techniques available to the industry, within the limit of existing plant capacity, to meet an additional demand for gas coke, and examines such factors as the effect of coal size in plant capacity, effect of gas calorific value on coal throughput and coke yield per ton of coal processed, the effect of C.W.G. on coke yield per ton of coal processed and the balance of gas and coke yields which can be achieved by practising benzole extraction using oil for the benzole therm replacement.

He also examines the techniques and effect of proportional coal gas firing on retort settings on coke availability and cost. His survey clearly indicates the wide flexibility available to the industry within the limits of existing plant capacity but, as he points out, the value of this flexibility is governed by economic considerations which are almost entirely dependent upon the relative values of coal and coke, that is to say the coal-coke price ratio, and unfortunately we have to realize that the ever increasing price of coal has tended to push this ratio in the wrong direction. In other words as the coal price rises it becomes more economic to convert coke into gas.

Mr. Davis highlights the difficulties associated with meeting a demand for free-burning smokeless fuels from high rank coals in the range 401-501, the traditional coals of the gasworks serving the large populous areas around the metropolis.

This position, in my view, is one of the most serious problems facing a full development of the policies contained in the Clean Air Bill. As Mr. Davis indicates, users of high rank coal will need to take the most rigorous precautions in the production and the preparation of the coke for this market. It is also essential that suitable appliances are used by the consumers of the material.

In my own contribution I have endeavoured to indicate the part which the 'carrier' gas process can play in making available additional coke tonnage from existing plant and the wide flexibility of operation made available by use of the process. Figures are given on the effect and cost of using proportional coal gas firing on the producers of continuous vertical retorts, and I make mention of our work on the production of free burning fuels from blended coals.

It will perhaps be of interest to the meeting to record that arising out of the trials and tribulations of our work on blended coals we are now producing in standard gasworks plant at large pilot scale a variety of prepared smokeless fuels of low, medium and high bulk density, the latter with shatter values equal to that of good quality foundry coke. These fuels can be produced to burn with ease on the ordinary household grate.

Dr. Eaton's paper deals with the important subject of coke quality and appliance performance, and he highlights the importance of coke grading and particularly, the maintenance of uniform coke size to a given consumer's premises. With normal gas cokes, it is of little use aiming at minimum standards of ignitability and combustion rate in our 2-in. by 1-in. coke, if we supply the customer with this material three times a year, and for the rest of the year 2½-in. by ⅜-in.—if he is lucky.

DISCUSSION

Mr. E. M. Edwards, Member of the Wales Gas Board, opening the discussion, said that circumstances in Wales were unusual, and the interest in coke was much less than elsewhere. This was due to the buying of gas from external sources, such as coke oven plants. This had caused a reduction of 1 mill. tons in the demand for coal over the past year. Coke marketing schemes would, therefore, make it necessary to make and sell as much coke as possible from the carbonizing plants that were still in commission. At the Maelor Works at Wrexham the cost of a therm from coal gas was less than a therm from coke, so it became economic to use any excess of coal gas made at Maelor, for heating the retorts and to sell the coke. This was actually being done in the summer months. Similarly, retorts might be heated by fire-damp where this gas was available, to increase the amount of coke for sale. Low volatile coal can be used to replace coke for steam raising. Accelerated carbonization by the Rochdale Process was of great interest and seemed to offer scope for the production of more coke. When gas is purchased from coke oven plants outside the gas industry and there was no corresponding amount of coke to be disposed of, Mr. Edwards thought that a type of smokeless fuel, which could be sold at a price in excess of the controlled price of ordinary gas coke, would be worth manufacturing if the public showed that it really needed it.

Mr. W. K. Hutchison, C.B.E., President of the Institution of Gas Engineers, said, before the war coke had been cheap and coke marketing had been completely uncontrollable. The lesson to be learnt from this was that there must be a complete flexibility between the prices of the two fuels made by the gas industry. He did not think that full economy of production of either coke or gas was possible if coke was used in the production of gas, and the price of the latter was influenced by the price of coke. Coke must be given a fair price, to make the use of gas for retort firing economically possible. To smooth peak loads, some other source of gas must be found which was independent of the coke and gas tie-up. In the South Eastern Gas Board, with this in view, experiments in the production of oil gas had stimulated the perfection of the Segas Process.

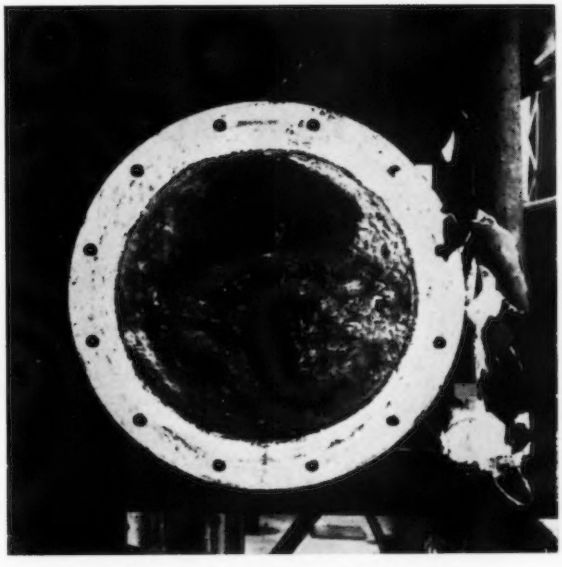
Mr. J. Powdrill, Cardiff, spoke of the lack of any real incentive to produce premium fuels in Wales, not because they were apathetic, but because South Wales was blessed with so much mineral wealth and particularly with the best steam coal in the world. In Wales they had an indigenous smokeless fuel under their feet, which was cheaper than any manufactured fuel of equal quality.

Mr. M. Sinclair Gatskill (Manchester) disagreed with Mr. Branson's reference to the use of coal for retort heating and pointed out that coal of a suitable price could compete with the coke used in producers. He also referred to the Rochdale Process, and made the point that although more coke was the result of a greater throughput of coal in a plant of smaller rated capacity, there was no greater yield of coke from a given weight of coal, though the cost might be slightly less due to lower capital charges. In his opinion the production of high priced, smokeless fuels was unnecessary. The ordinary high temperature gas coke could meet all the demands made upon it by the public, provided it was properly processed. The grading of domestic fuel, in his opinion, was particularly important and second only to the education of the consumer in how to use it properly.

Mr. Hodkinson, in reply to the questioners, pointed out how the Rochdale process could be used for meeting peak demands. In fact for the past two years in Paris, peak-load difficulties had been successfully overcome by using the Rochdale process. On the question of the production of premium priced fuels, he thought the supreme example was Phurnacite, now being manufactured by the National Coal Board at Aberaman in South Wales. He was quite certain that the public demand for this fuel would remain. At the present time its price was entirely governed by what the public wanted and were prepared to pay in a very competitive market. The Clean Air Bill was going to disturb the coke to coal production ratio in the wrong direction, but the peak load in solid fuel demands could only be met by solid fuel, and the N.C.B. considered that plants for the production of premium priced fuels were necessary and were extending the Phurnacite plant in South Wales. They were also considering building other smokeless fuel plants in the East Midlands, despite the indigenous fuels in those areas.

Mr. Branson stressed the need for the gas industry to get in first and exploit the markets for solid fuel which the Clean Air Bill would create. If our industry did not, the N.C.B. would. In his opinion the premium fuels should not be made in the coal fields but in the 'black' areas where they would be consumed. The demand for such fuels should gradually increase, and perhaps at the end of five years the demand for a high quality coke would be more apparent. It was essential therefore that preparations should be made to manufacture this high quality fuel, and special attention should be paid to ash content, which must be as low as possible. The coke made from Midland coals showed a good ignitability but unfortunately this was not true of coke from Durham or traditional coking coals.

THE PROBLEM OF GUM FORMATION*



Inlet No. 3 set purifiers at Darlington.

BY

F. W. SAWYER, M.INST.GAS E.,
WORKS MANAGER, DARLINGTON,
NORTHERN GAS BOARD.

By gum in gas, we in the British gas industry generally mean 'vapour-phase' gum, distinct from 'liquid-phase' gum, although mixtures of both can, and often do, occur.

'Liquid-phase' gum-formation results from the polymerization of certain condensable unsaturated hydrocarbons being associated with, and accelerated by, oxidation to resins. Further acceleration is also promoted by the presence of organic sulphur-compounds, particularly the mercaptans. The unsaturated hydrocarbons held responsible are, styrene, indene, and coumarone and may be largely removed where benzole 'stripping' is practised.

'Vapour-phase' gum-formation results from the action of oxides of nitrogen with certain hydrocarbons, namely the conjugated diolefines, such as butadiene and cyclopentadiene.

According to Doctor Hollings the speed of gum formation is not dependent upon the rate of oxidation of nitric oxide to nitrogen peroxide, which is very slow, but he suggests that a diolefine-peroxide complex, when formed, catalyses further interaction rapidly.

In 1935, the Darlington Corporation entered into an agreement with Straker & Love for the supply of a maximum volume of 4 mill. cu.ft. of unpurified, but scrubbed of ammonia, gas per day from a new coke oven plant, in course of erection at Willington. Deliveries were to begin in April, 1937.

The ovens are still in good condition and operation, half the battery being scheduled for rebuilding in 1960 representing a 'life' of 8,500 days—a sound reflection on base-load operation. Ammonia recovery is indirect and benzole extraction is by gas-oil. No 'after-cooler,' subsequent to compression, was installed until purification commenced last July. Gas entered the main at temperatures up to 230°F. and at pressures up to 30 lb. per sq. in.

The main is 12-in. bore, and laid in spun cast iron, with Stanton-Wilson flexible joints, with the exception of steel pipe, with welded joints, laid under three long rail and river crossings.

Deposits in the main were first noticed in June, 1946, and since then annual systematic cleaning and maintenance programmes have been carried out. It is clear that the main was functioning very well as a purifier, with free sulphur, inter-alia, being deposited. The sulphur has then apparently been 'picked-up' into suspension in the gas, and further deposited at subsequent directional changes.

These deposits, when dry and powdery, showed a very high porosity but negligible resistance to gas flow. The periodical exposures to air, for cleaning purposes, may well have promoted further depositions.

Since purification at Brancepeth began heavy deposits of ammonium-chloride have appeared in the Darlington works inlet main. These results confirm that the hydrated corrosion products in the forepart of the main have maintained a continuous removal of some H_2S with absorption of the 'free' oxygen necessary for the continuity of the process. The H_2S content of the gas leaving Brancepeth was up to 300 grains per 100 cu.ft. and, up to 200 grains, when it reached Darlington, but completely devoid of 'free' oxygen, so that oxidation, other than that of H_2S, was occurring within the main. Conditions prevailing were therefore suitable for the efficient removal of both nitric oxide and hydrocyanic acid. Absorption of nitric oxide depends upon its loose combination with ferrous sulphide to form complex ferro-nitrosyl sulphides, or Roussin salts.

These salts are readily decomposed by an increase in temperature, and by the presence of 'free' oxygen, liberating nitric oxide.

The persistent findings of a 'black gummy substance' in the main may be a further source of nitric oxide although the apparent formation of gum, as an end-product in a main carrying H_2S-laden gas, is difficult to accept in theory. The occurrence of this gummy material, however, has only been observed in the forepart of the main, *i.e.*,—where 'free' oxygen was present. This may account for the frequent seizure of the Brancepeth Connersville meter at Darlington, by a gummy paste, and the apparent evolution of nitrogen peroxide from gas mains at Darlington, containing sulphide deposits, after only a few minutes exposure to air, frequently with spontaneous combustion.

From July 1, 1955, Darlington town gas was redeclared at 475 B.Th.U. per cu.ft. from its previous value of 500. At the same time coke oven gas from Brancepeth, was to be purified before transmission, and its calorific value reduced from 515 B.Th.U. to 475 by the addition of 8% producer gas and 3% air admission to purifiers.

From July 6 until the end of August, we experienced a summer of long warm and sunny days. These conditions would preclude, and in fact reverse, the usual condensation of water-vapour within the holders. By the middle of August, the presence of gum in town gas was definitely suspected, and at the end of the month both its character and its source were established.

The dilution of Brancepeth coke oven gas is by mixing it at the inlet to the purifiers, with P.G. manufactured in a pressurized, and completely automatic type of plant. No provision

* From a paper to the Northern Junior Gas Association at Durham, May 12.

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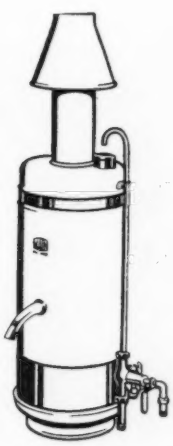

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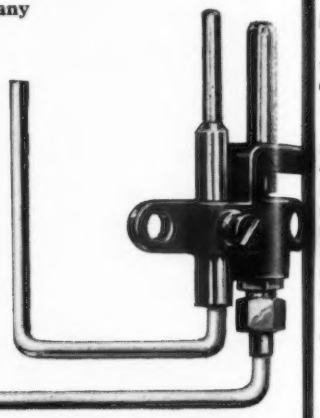

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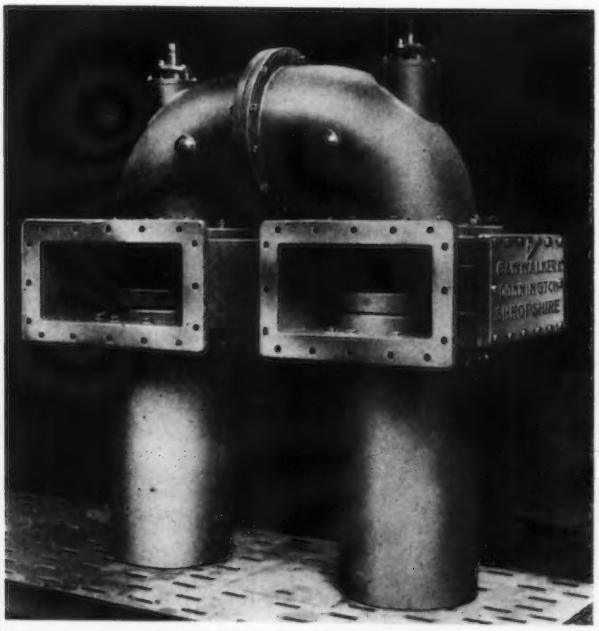

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was contracted for the dilution of Randolph coke-oven gas, which had been received at 500 B.Th.U., purified, from the preceding December. Due to some purifier structural defects, however, which we discovered in January, it was thought prudent to maintain its subsequent passage through our purifiers until permanent repairs were effected. At the outset of the changeover it was decided that the Brancepeth gas should continue to flow through our purifiers, for a period sufficiently long for:—

(a) The satisfactory operation of the purifiers to become established at the coke ovens—particularly as their staff had had little previous experience of the process;

(b) the assurance that no possibility remained of clean gas becoming fouled by H_2S in its passage through a main, which we knew contained sulphide deposits.

In fact, the gas conformed to statutory purity requirements in less than 24 hours, but condition (a) was adhered to.

It was anticipated that the reduced calorific value might have some effect on consumers' appliances, although this was not considered to be a general possibility, as only few appliances had been already finely adjusted.

To obviate a possible surge of complaints, however, a gradual reduction in calorific value was arranged—in the first instance to 485 B.Th.U. per cu.ft. This was effected by arranging for Brancepeth gas to be delivered at approximately 495 B.Th.U., so permitting an admission of 2% air to the purifiers at the Bishop Auckland, Spennymoor and Crook units. At Darlington, however, 3 to 4% air admission was necessary for dilution, increasing the oxygen content of the town gas from a normal 0.5% to over 1.0% by volume.

The first complaints were received during the second week of July. These were flame-failures of water-heater pilot lights —at first thought to be due to over-aeration.

Sixty Complaints a Day

In early August, a maximum number of sixty complaints was being received per day. Trouble was also being experienced with district high-pressure governors, and on the works, with Fairweather recording calorimeter governors, 'Bray'-type clearing jets, and with our No. 6 station governor, which is automatically gas-loaded.

Deposits were collected from some of these 'trouble-spots' for examination, and gave the following results on examination:

All deposits were of varying shades of brown and 'tacky.' On exposure to the atmosphere, these hardened and darkened in varying degree. All were fairly soluble in acetone, and substantially so in dilute caustic-soda. The gum, in apparent solution, was readily reprecipitated by acidification, being similar to the gelatinous mass of freshly precipitated ferric-hydroxide. This is considered to be a characteristic test for nitrogenous gum. Analyses of the gums showed contents of up to 50% water, 50% iron as Fe_2O_3, 10% oily matter soluble in CS_2, and 4% sulphur.

All deposits, when heated, evolved copious volumes of NO_2, NH_3 and H_2S, in that order.

These results, together with the characteristic fact that consumers' complaints were 100% flame-failures of pilot-lights, established that our trouble was due to the formation of nitrogenous gum.

'Diary of Events'

In order to clarify and ease the description of this section, the action taken is presented in diary form:—

July 15.—Due to complaints received, air admission to purifiers was reduced to 1%, and calorific value of Brancepeth coke oven gas to 480 B.Th.U. per cu.ft.

July 26.—Air to the purifiers at Darlington was shut-off.

July 29.—Darlington purifiers were shut off, and both the Brancepeth and Evenwood gases passed to the holders directly after metering.

August 12.—Complaints had now assumed serious proportions, and the presence of gum was suspected for the first time. No trouble was being experienced at any of the other units on our grid. The Bishop Auckland, Spennymoor and Crook units were all receiving Brancepeth gas, which was still passing through their purifiers. The Barnard Castle unit was receiving Randolph gas, which again was still passing through the Randolph purifiers. The Richmond unit was receiving our own mixture of approximately 45% Randolph and 55% Brancepeth gases, via the Darlington high-pressure system. By inference from (1) and (2), both Brancepeth and Randolph gases were again passed through the Darlington purifiers, but with no air admission.

August 19.—Steam was admitted into the purifiers' main inlet and also into the inlet of each purifier.

September 1.—By this time exhaustive testing throughout the Division had shown that nitric oxide was being released in the Brancepeth main.

September 7.—The purifiers at Darlington were again shut-off and steam was now admitted into the inlet holder main.

September 12.—Gum content of low-pressure town gas decreased to 20 grains per million cu.ft. with a reduction in nitric oxide content to 0.04 parts per million.

As we shall be manufacturing gas at Darlington throughout the summer our future course of action will be, if troubled by nitric oxide: (1) Purified Brancepeth gas will be mixed with unpurified coal gas, and passed through our purifiers; (2) steam admission will be resumed into inlet holders. The water-spray into the compressor's outlet main is now in continuous use. In the meantime, it is hoped that extensive cleaning of the Brancepeth main and the inlet of the Darlington purifier mains, this spring, will be effective in reducing, considerably, the source of the nitric oxide.

THE PRESIDENT'S ADDRESS (*from p. 604*)

whole, bearing in mind that a satisfied and warm consumer is also likely to be a good customer for those other services, of cooking and water heating, which make up the summer load.

I do not under-estimate the size of the task involved in winning over even 10% of the consumers to a whole-house service of gas; the proportion would have to be considerably higher if they were of the lower-income groups. It would be necessary to have the whole-hearted co-operation of the manufacturers of gas appliances and all concerned with research and development in that field, in order to make available a suitable range of cheap, attractive, and efficient equipment. The traditional gas fire will not do, but recent improvements in design, whereby convection plays an increasingly important part, point the way to a solution that can be applied at least in existing houses with adequate chimney and flues. The modern tendency towards providing only one, or at most two, chimneys sets a further problem. Service units containing water heating, radiant heat and hot air convection to other parts of the house might find favour with architects, and would have the advantage of securing the best possible balance of summer and winter load. Co-operation at the gasworks end might also be sought, for the growing popularity of the paraffin heater is undoubtedly due in part at least to the efficiency of flueless heating possible only with a fuel of really low sulphur content.

Conclusion

On reflection, I see that my address has strayed further into the realm of speculation than is quite fair in circumstances where the conclusions are not to be subjected to the full test of discussion and debate. It seems inescapable, however, that the industry must take this opportunity to apply all its resources and ingenuity, combined with the research effort that the Gas Council is undertaking, to seek a new advance. What I have tried to do is to indicate one direction in which that is possible, and to suggest that the operational and technical difficulties to be overcome are not insuperable.

The gas industry has at its disposal a wealth of skill in the arts of making, distributing and selling gas, and members of this Institution from all sides of the profession would welcome the opportunity of taking part in a fresh attack on the problem of providing adequate heat services in an expanding economy. The techniques are there; the tactics remain to be worked out.

In conclusion, I want to pay a sincere tribute to all who have made my year of office the pleasant and stimulating experience that it has been, and here at once I must express the debt that each succeeding president owes to the efficiency and courtesy of Dr. Braunholtz and all his staff at the headquarters.

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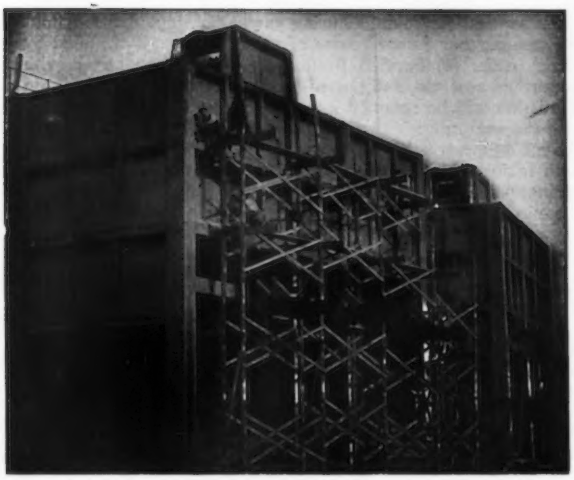

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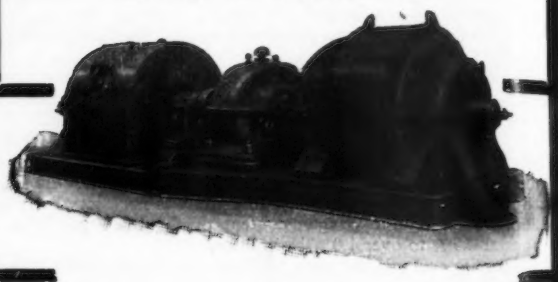

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APPOINTMENTS VACANT

COLOMBO GAS AND WATER COMPANY LIMITED

APPLICATIONS are invited for the position of ASSISTANT GAS ENGINEER and MANAGER in Ceylon. Age 30/35 years. Salary £1,500 per annum, plus allowances, free passages. Six months home leave after term of four years.

Write with full details of experience to The Secretary, 148, Gresham House, Old Broad Street, London, E.C.2.

WEST MIDLANDS GAS BOARD

WORCESTERSHIRE AND HEREFORDSHIRE DIVISION
WORKS CHEMIST—WORCESTER

CANDIDATES should hold an appropriate qualification and should preferably be capable of exercising chemical control of modern gasworks procedure.

The salary will be within Grade 7 (£670 x £20 — £750) of the National Salary Scales.

The post is pensionable, and the successful candidate may be required to pass a medical examination.

Applications giving details of age, qualifications and experience should be addressed to Mr. C. F. W. Rendle, Divisional General Manager, West Midlands Gas Board, Newtown Road, Worcester, to reach him not later than June 11, 1956.

J. C. INGRAM,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON AND DISTRICT DIVISION
SENIOR HOME SERVICE ADVISER

CANDIDATES should have had at least two years' training in domestic science and hold an appropriate diploma or certificate. It is desirable that they should also have considerable demonstrating experience and a good personality.

The successful applicant will be stationed at the Wolverhampton District Showroom and will be directly responsible for all Home Service work and Home Service staff in that District. She will be the Senior Home Service Adviser for the Division and will carry appropriate responsibility.

The salary will be within Special Grade 6 (£492-£579 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable, and the successful candidate may be required to pass a medical examination.

Applications stating age, and giving details of training and experience, together with the names of two referees, should be addressed to Mr. Stanley Jones, Divisional General Manager, West Midlands Gas Board, Kensington House, Bath Street, Dudley, to reach him not later than June 11, 1956.

J. C. INGRAM,
Secretary to the Board.

Amended Advertisement

SCOTTISH GAS BOARD

SOUTH EAST DIVISION
HAWICK SUB GROUP
ASSISTANT TO THE ENGINEER & SUB GROUP MANAGER

APPLICATIONS are invited for the above position. Candidate should have Gas Works' experience with a Mechanical or Civil Engineering background, and Drawing Office experience would be an advantage.

The Salary offered is Provincial ' A.' Grade, A.P.T. 7 (£670-£750 per annum) with placing according to qualifications and experience. The successful applicant will be required to undergo a medical examination and subscribe to the Board's Superannuation Scheme.

A house at a very reasonable rental is available.

Applications stating age, particulars of training, qualifications and experience, together with the names of two referees, should reach the undersigned not later than 7 days after the appearance of this advertisement.

ROBERT COWIE,
Gas Works, Engineer & Sub Group Manager.
Hawick,
Roxburghshire.

NORTH EASTERN GAS BOARD

BRADFORD GROUP
BIRKSHALL WORKS
ASSISTANT WORKS MANAGER

APPLICATIONS are invited for the above position at a salary within Grade A.P.T. 12 (Provincial ' A ') (£900-£1,025 per annum).

Applicants should possess the Higher Grade Certificate of the Institution of Gas Engineers, in Gas Engineering (Manufacture) and have experience of modern Gas Engineering practice. They should also be fully conversant with the operation of Continuous Vertical Retorts, Automatic Carburetted Water Gas Plant, together with modern ancillary and electrical equipment.

The successful applicant will be required to pass a medical examination and to join the Board's Staff Pension Scheme.

Applications stating age, experience, qualifications and present position, should reach the Group General Manager, North Eastern Gas Board, Bradford Group, Britannia House, Bradford, by June 7, 1956.

J. C. GARDNER,
Secretary.

NORTH EASTERN GAS BOARD

BRADFORD GROUP
KEIGHLEY DISTRICT
SHIFT SUPERVISOR

APPLICATIONS are invited for the above position at the Thwaites Works at a salary within Grade A.P.T. 5a (Provincial ' A ') (£595-£675 per annum).

The successful applicant will be responsible to the Management for the operation and control of the Retort House and Water Gas and Ancillary Plant. He will also be responsible for full control of the Works outside normal working hours.

Applicants should have a sound working knowledge of the operation of continuous vertical retorts and carburetted water gas plant, and must be generally conversant with Gasworks practice, with some experience of the control of Works personnel.

A house will be available on rental.

The successful applicant will be required to pass a medical examination and to join the Board's Staff Pension Scheme.

Applications, in writing, should reach the Group General Manager, North Eastern Gas Board, Bradford Group, Britannia House, Bradford, by June 7, 1956.

J. C. GARDNER,
Secretary.

(*Classified advertisements continued on page* 614)

There was nothing one-eyed about Nelson . .

. . when it came to victory at sea, but many people with normal sight have a blind spot about photography. The fact is that instead of going to any old photographer, it *pays* you to go to an expert because the results are exactly what you want. If you consult **Walter King Photographs,** 11, Bolt Court, Fleet Street, E.C.4. (Telephone FLEet Street 2236) you will find their prices are no more. As for their work—well, you can see the difference with half an eye.

WALTER KING PHOTOGRAPHS

The sign of BETTER Photography

APPOINTMENTS VACANT (*ctd.*)

EAST MIDLANDS GAS BOARD

LEICESTER AND NORTHANTS DIVISION
SECTION LEADER DRAUGHTSMAN

APPLICATIONS are invited for the position of SECTION LEADER DRAUGHTSMAN in the Divisional Headquarters at Leicester. Salary within Grade A.P.T. 8 (£710-£790 per annum) commensurate with qualifications and experience.

The person appointed will be engaged on layout work involving gas boosters, governors, etc., and associated pipework, and will be required to supervise the work of junior draughtsmen employed on detail drawing work. Preference will be given to a man holding the H.N.C. in Mechanical Engineering or equivalent, and experience in the Gas Industry, or similar, would be an advantage.

The position is pensionable and the successful applicant will be required to pass a medical examination.

Applications stating age, and giving details of education, qualifications and experience, together with the names of two referees, should be addressed to reach the undersigned not later than June 9, 1956.

H. B. TAYLOR,
Divisional General Manager.

Gas Offices,
Millstone Lane,
Leicester.
May, 1956.

EAST MIDLANDS GAS BOARD

SHEFFIELD & ROTHERHAM DIVISION
DISTRIBUTION TECHNICAL ASSISTANT

APPLICATIONS are invited for the position of DISTRIBUTION TECHNICAL ASSISTANT in No. 2 District Distribution Department, Rotherham, at a salary within Grade A.P.T. 7, of the National Salary Scales for Gas Staffs (£670/£750 per annum). Initial placing will be dependent upon the qualifications, experience and ability of the successful candidate.

Applicants should have had considerable practical experience in mains and service work generally and have some knowledge of the design of distribution systems together with experience in the estimation of costs. A house is available at a reasonable rental.

The post is pensionable and the successful applicant will be required to pass a medical examination.

Applications giving full details of age, education, qualifications, experience, present position and salary, together with the names and addresses of two referees should be addressed to reach the undersigned not later than June 18, 1956.

CHAS. C. WOOD,
Divisional General Manager.

Gas Offices,
Commercial Street,
Sheffield, 1.
May 17, 1956.

FIRST CLASS GASFITTER required for Wolverton/Stony Stratford District (Northampton Group): Provincial A rates of pay. A house situate in Newport Pagnell is available on reasonable terms under a Service Occupation Agreement.

Applications stating age, qualifications and experience, together with the name of a referee, should be addressed to reach Mr. E. B. Craddock, Group Manager, East Midlands Gas Board, 45, Abington Street, Northampton, not later than June 9, 1956.

H. B. TAYLOR,
Divisional General Manager.

EAST MIDLANDS GAS BOARD

SHEFFIELD & ROTHERHAM DIVISION
DISTRIBUTION TECHNICAL ASSISTANT

APPLICATIONS are invited for the position of DISTRIBUTION TECHNICAL ASSISTANT in the Divisional Distribution Department, Sheffield, at a salary within Grade A.P.T. 7 of the National Salary Scales for Gas Staffs (£670/£750 per annum). Initial placing will be dependent upon the qualifications, experience and ability of the successful candidate.

Applicants should have had some practical experience in mains and service work generally and have considerable knowledge of the design of distribution systems, together with experience in the estimation of costs. Preference will be given to candidates possessing a recognised technical qualification.

The post is pensionable and the successful applicant will be required to pass a medical examination.

Applications giving full details of age, education, qualifications, experience, present position and salary, together with the names and addresses of two referees should be addressed to reach the undersigned not later than June 18, 1956.

CHAS. C. WOOD,
Divisional General Manager.

Gas Offices,
Commercial Street,
Sheffield, 1.
May 17, 1956.

EAST MIDLANDS GAS BOARD

APPOINTMENT OF ASSISTANT DIVISIONAL ENGINEER
NOTTS. AND DERBY DIVISION

APPLICATIONS are invited for the above appointment from candidates with an engineering background and experience in Gas Works practice. A degree in Engineering and/or Corporate Membership of an approved Institution of Gas, Civil or Mechanical Engineers, is an essential qualification.

Gas is produced at six large and medium sized works in the Division and is also purchased from a number of coke ovens for bulk distribution through the grid system; the Assistant Divisional Engineer will be responsible for the control of production and technical efficiency of the works and, in the absence of the Divisional Engineer, he will also supervise planning and constructional work within the Division.

The commencing salary will be not less than £1,300 per annum.

The position is pensionable and the successful applicant will be required to pass a medical examination.

Applications stating age and giving details of education, qualifications and experience, together with the names of two referees, should be addressed to the undersigned not later than June 9, 1956.

A. GWYNNE DAVIES,
Secretary.

East Midlands Gas Board,
Beverley House,
University Road,
Leicester.

EAST MIDLANDS GAS BOARD

LEICESTER GROUP
ACCOUNTANT (COSTS AND EXPENDITURE)

APPLICATIONS are invited for the position of ACCOUNTANT (Costs and Expenditure) to the Leicester Group of Undertakings. The post is graded A.P.T. 12 (salary range £900/£1,025) and the initial salary will be commensurate with the qualifications and experience of the successful applicant.

The Accountant will be responsible to the Divisional Accountant for cost and expenditure accountancy in the Group, which comprises some 152,000 consumers, and his duties will include the general supervision of a punched card installation.

Applicants should hold an accounting qualification and have the ability to supervise and control staff, preference being given to a candidate with experience in the development of management accounting techniques.

The appointment is pensionable and the successful applicant will be required to pass a medical examination.

Applications stating age, and giving details of qualifications, experience, present position and salary, together with the names of two referees should be submitted to reach the undersigned not later than June 16, 1956.

H. B. TAYLOR,
Divisional General Manager.

Gas Offices,
Millstone Lane,
Leicester.
May 26, 1956.

EAST MIDLANDS GAS BOARD

NOTTS. & DERBY DIVISION
HOME SERVICE ADVISERS—Derby District
Heanor District—Burton-upon-Trent District

APPLICATIONS are invited for the positions of HOME SERVICE ADVISERS in the above Districts.

The salary payable will be within the range £405-£525, the commencing salary depending on age, qualifications and experience.

Candidates must be capable of working independently and be in possession of a recognised Diploma in cookery and/or domestic science. They should be proficient in the practical demonstration of gas cooking, laundry and other appliances involving the use of gas in the home.

The positions are pensionable and the successful applicants will be required to pass a medical examination.

Applications stating District applied for, age, experience, and present position, and giving full particulars of training and qualifications, together with the names of two referees, should reach the undersigned not later than Friday, June 15, 1956.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts. & Derby Division,
P.O. Box No. 62,
Friar Gate,
Derby.

R. & A. MAIN, LTD., require a trained TECHNICAL SALES REPRESENTATIVE in their Catering Equipment Division to cover Scotland and the North of England. Must be first class man, well educated, of good appearance and be able to plan and carry out complete kitchen schemes. Good prospects. Superannuation scheme. Reply in own handwriting stating age and experience to General Manager, Gothic Works, Falkirk.

WOODALL-DUCKHAM CONSTRUCTION CO. LTD. has a vacancy in connection with development and testing work on coke oven and by-product plants. The position would involve three to four years of interesting and varied site experience with opportunities for initiative following which a Head Office post would be offered. Candidates, aged preferably 25 to 28, should be of degree standard and some experience in this field would be an advantage. Starting salary £700 to £800 according to age and experience; staff bonus; lodging allowance while outside; generous pension and insurance schemes. Apply in writing giving particulars of age, qualifications and experience to The Personnel Officer, Woodall-Duckham Construction Co. Ltd., 63/77 Brompton Road, London, S.W.3.

SOUTH EASTERN GAS BOARD

GAS ENGINEERING DRAUGHTSMAN,
95, High Street, Rochester.
Kent County Division

CANDIDATES must have had drawing office experience of structural steelwork and steel and cast iron pipework and be capable of preparing detailed working drawings.

Salary within Grades 6-7 (Prov. 'A') £610-£795 p.a., according to qualifications and experience.

Applications in writing, quoting reference V10/677 and giving full details, should reach the undersigned within seven days.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SOUTH EASTERN GAS BOARD

TWO HOME SERVICE ADVISERS
EAST SURREY DIVISION

SUCCESSFUL applicants will be required to conduct demonstrations, give lectures and advise consumers in their own homes in the use and care of gas equipment.

Preference will be given to applications from persons who—

(a) have had not less than 3 years' experience in demonstrating in Gas Industry; and
(b) have undergone training for 2 years at a recognised training college of Domestic Arts; and
(c) hold a diploma in cookery, housewifery and laundry work.

Salary within Grade 6—£528-£592 p.a. (Met. Area) or £504-£568 (Prov. 'A')—according to location.

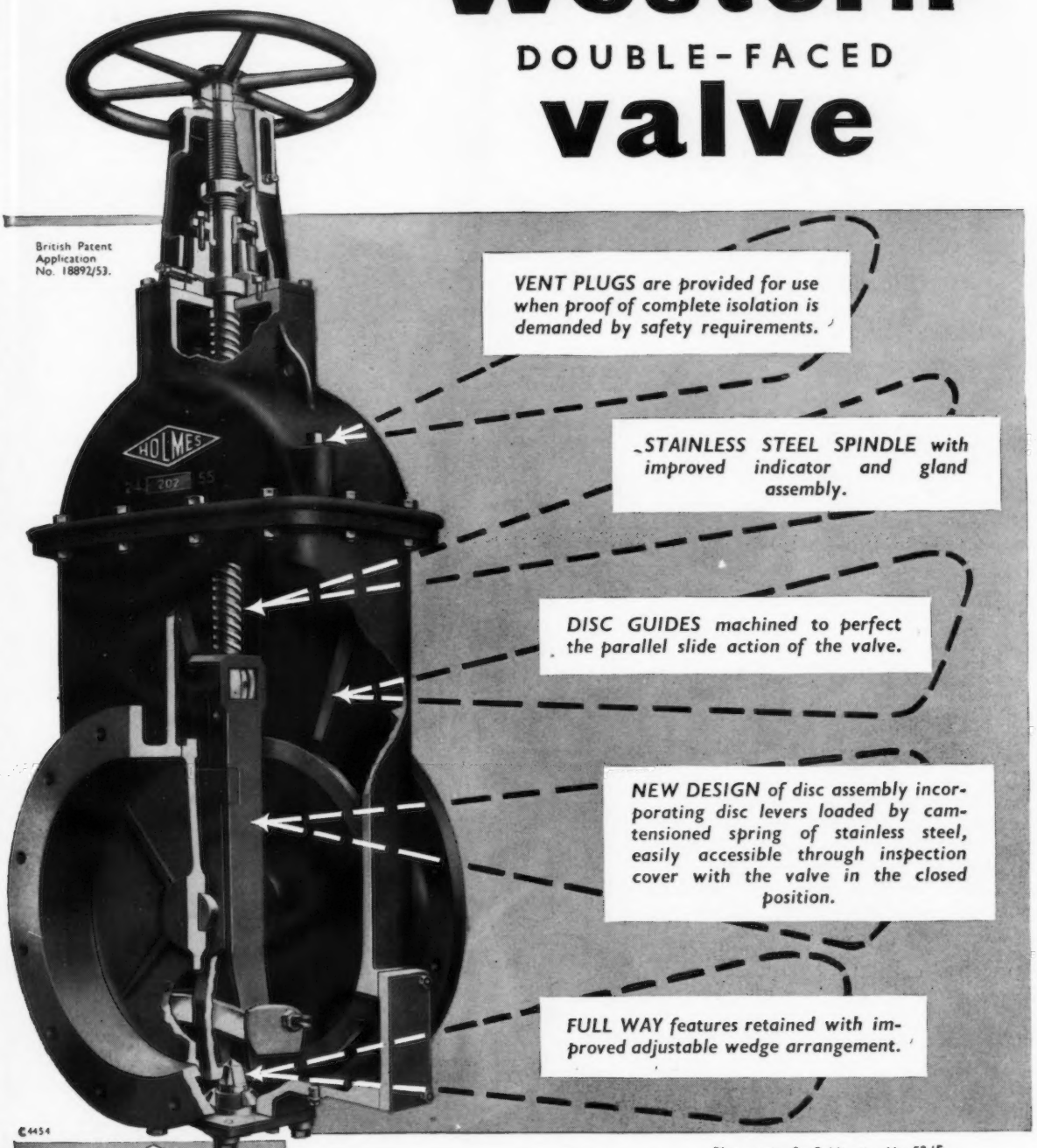
Applications will be considered from persons who have not the experience indicated in (a) above, but in such circumstances the commencing salary will be within a lower grade than 6.

Applications in writing, quoting reference V10/583 and giving full details should reach the undersigned not later than seven days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

*THE RE-DESIGNED Western DOUBLE-FACED valve

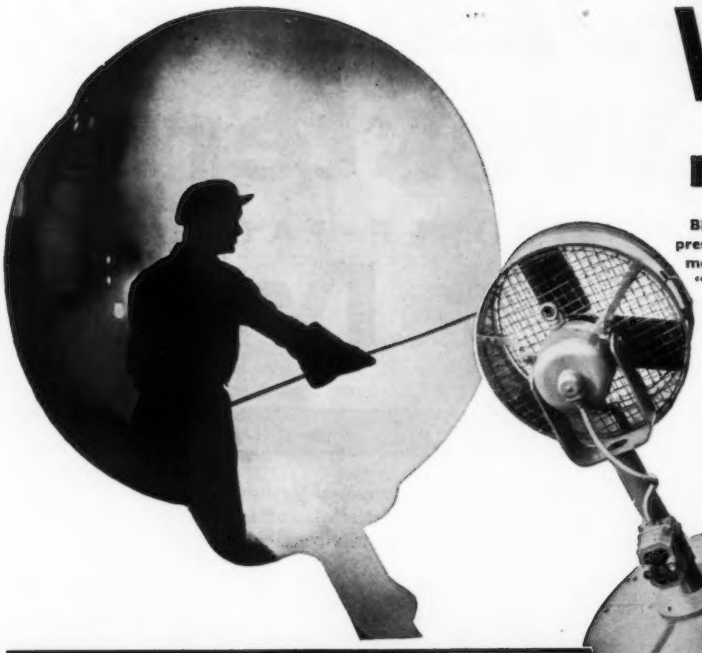

British Patent Application No. 18892/53.
VENT PLUGS are provided for use when proof of complete isolation is demanded by safety requirements.
STAINLESS STEEL SPINDLE with improved indicator and gland assembly.
DISC GUIDES machined to perfect the parallel slide action of the valve.
NEW DESIGN of disc assembly incorporating disc levers loaded by cam-tensioned spring of stainless steel, easily accessible through inspection cover with the valve in the closed position.
FULL WAY features retained with improved adjustable wedge arrangement.
HOLMES
C4454

Please write for Publication No. 52/5

FOUNDED 1850 HOLMES HUDDERSFIELD

W. C. HOLMES & CO. LTD.

HUDDERSFIELD · LONDON · BIRMINGHAM



WHY

man-cooling?

BECAUSE MEN CANNOT WORK at full stretch under the oppressive conditions existing in industrial "hot spots" without some means of relief. Often they resort to "taking a breather". But "breathers" are costly and time-wasting.

Consider the alternative.

The "Tornado" method of man-cooling definitely encourages production all the time. Man-cooling fans deliver, for as long as is necessary, a brisk, cooling air current which relieves excessive body heat and improves breathing conditions. Designed particularly for use in the "heavy" trades they combine an easy portability with robust construction — two essential characteristics.

If your concern is for workers in iron and steel works, foundries, boiler houses, gas retort houses, glass works or "lighter" industries where efficiency is bound up with the maintenance of comfortable working conditions then you should see Publication No. 9/7.

A copy is waiting for you.

EX-STOCK

Keith Blackman LIMITED

MILL MEAD ROAD, TOTTENHAM, LONDON, N.17

'Phone: Tottenham 4522 (twelve lines). 'Grams: "Keithblac, Norphone, London."

BRANCH OFFICES AT MANCHESTER, BIRMINGHAM, LEEDS, GLASGOW, NEWCASTLE-ON-TYNE, PENARTH near CARDIFF, AND BELFAST

486

Railway Sidings Construction

Design, Installation and Maintenance

The Grant Lyon Railway Sidings installation for the new 60-ton Electric Melting Furnace Project at the Stocksbridge Works of Messrs. Samuel Fox & Co. Ltd. included: lifting 3½ miles of track from old sidings; filling up and making new foundations to a maximum depth of 12 ft. using 15,000 tons of slag; laying temporary track; laying approximately 5¼ miles of permanent track involving 39 leads, 5 tandems, 1 diamond, 5 single slips and 1 double slip.

Enquiries are invited for the design, installation and maintenance of railway sidings.

GRANT LYON
AND COMPANY LIMITED
SCUNTHORPE

Railway and Civil Engineering Contractors
HEAD OFFICE: Scotter Road, Scunthorpe, Lincs.
Phones: Scunthorpe 2308/9; Manchester DEAnsgate 7805; Swansea 251

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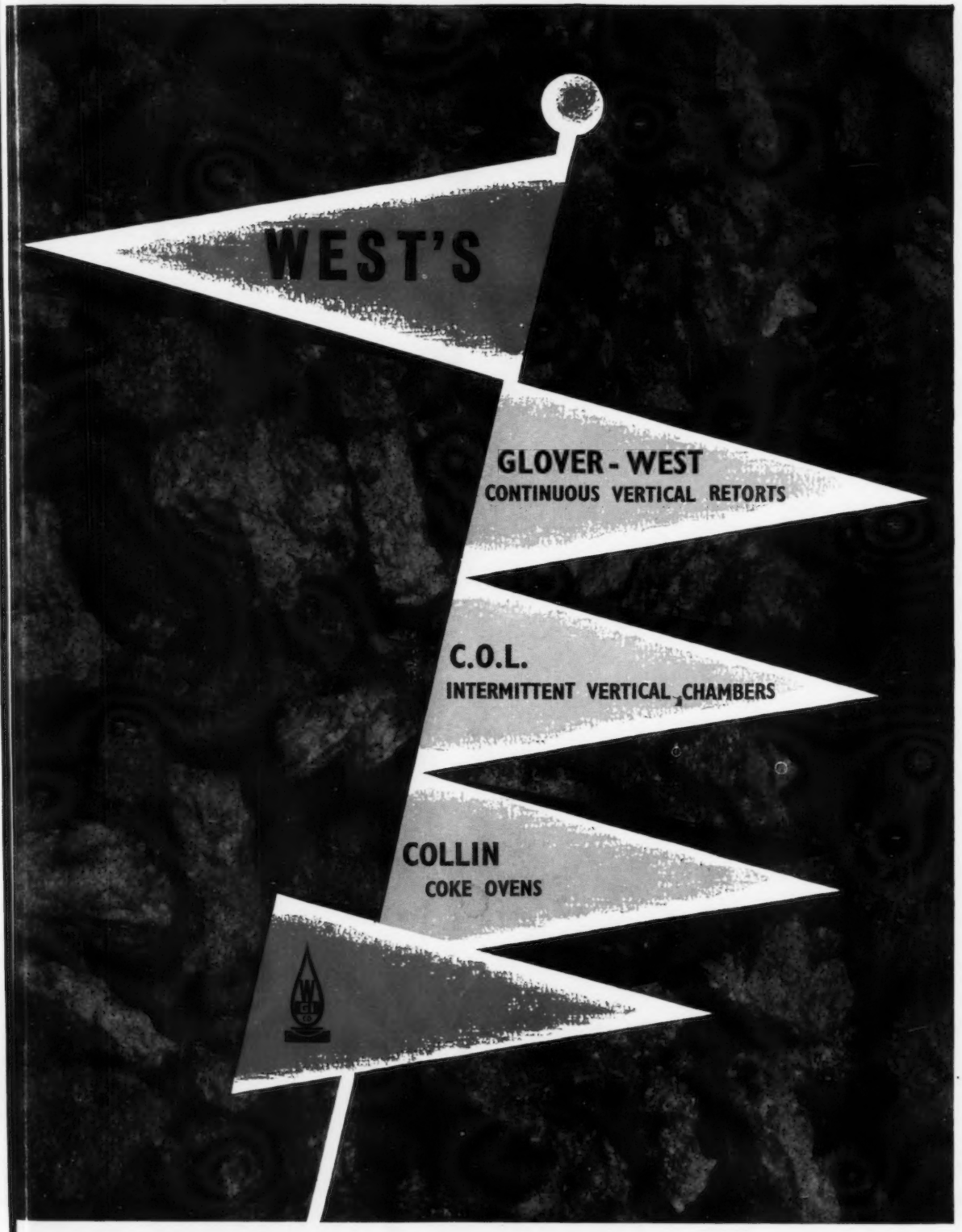
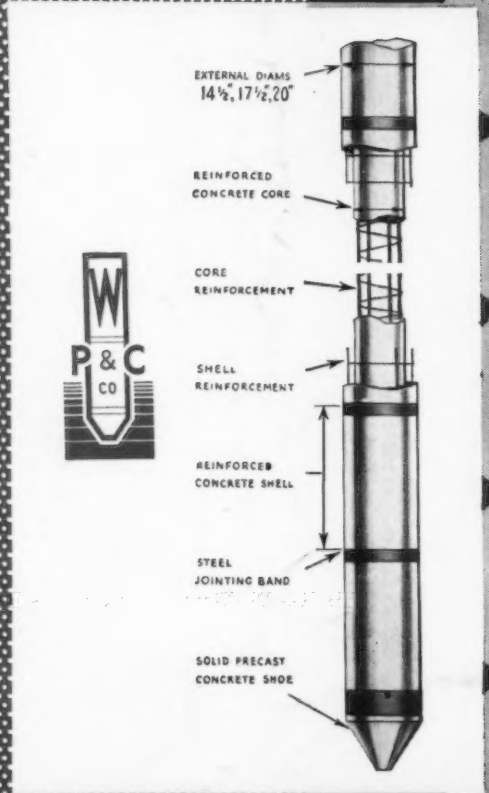


WEST'S GAS IMPROVEMENT COMPANY LIMITED
MILES PLATTING, MANCHESTER 10 TEL: COLLYHURST 2961 GRAMS: STOKER, MANCHESTER
AND IN LONDON
Columbia House, Aldwych, W.C.2. Tel: HOLborn 4108 C.O.L. Div: Chandos House, Buckingham Gate, S.W.I. Tel: ABBEY 6912

THESE FACTS MEAN

STABILITY...



In West's Shell Piling System a reinforced concrete tube, or shell, in sections, is threaded on to a steel mandrel at the base of which is a solid concrete shoe, the whole of the tube, mandrel and shoe being driven into the ground until a predetermined set is obtained.

The mandrel is then withdrawn, leaving the shoe and reinforced concrete tube in position after which the core reinforcement cage is introduced, followed by the casting, in situ, of the solid concrete column which forms the unstressed core of every West's Shell Pile.

Please write for our latest publications

WEST'S *SHELL* PILING

WEST'S PILING & CONSTRUCTION COMPANY LIMITED
Foundation Specialists · Design and Construction in Reinforced Concrete
BATH RD., HARMONDSWORTH, MIDDX. *Tel.: WEST DRAYTON 2288*

London : Columbia House, Aldwych, W.C.2.
Midlands : 83 Edmund Street, Birmingham 3.
North : Albion Ironworks, Manchester 10.
Scotland : 169 Hamilton Road, Glasgow, E.2.
Paris (Seine) : Compagnie Général de Construction de Fours

WF